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August 2012

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- AUTOMATE BACKUPS ■ STREAM MEDIA TO ALL DEVICES ■ DIY VIDEO SURVEILLANCE



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1. Source: Intel Performance comparison using SPECint*_rate_base2006 benchmark. Baseline score of 262 on prior generation 2S Intel® Xeon® processor X5690 (3.46 GHz, 6 core, 12MB L3, 6.4 GT/s, 130W) based platform published at www.spec.org as of 6 Sept 2011. New score of 479 on 2S Intel® Xeon® processor E5-2680 (2.70 GHz, 8 core, 20MB L3, 8.0 GT/s, 130W) based platform published at www.spec.org as of 21 March 2012 using two Intel® Xeon® processor E5-2680, Turbo Enabled, EIST Enabled, Hyper-Threading Enabled, 128 GB memory (16 x 8GB DDR3-1600), Red Hat® Enterprise Linux Server release 6.2 for x86_64, Intel® Compiler 12.1. 2. Comparison of virtual machines based on IBM internal sizing estimates when comparing HS23 using Intel® Xeon® E5-2680 processor with 256GB memory to HS22 using Intel® Xeon® X5690 Processor with 192GB memory. 3. IBM Global Financing offerings are provided through IBM Credit LLC in the United States and other IBM subsidiaries and divisions worldwide to qualified commercial and government clients. Rates for credit-qualified clients and are based on a client's credit rating, financing terms, offering type, equipment type and options, and may vary by country. Other restrictions may apply. Rates and offerings are subject to change, extension or withdrawal without notice. The 0% financing over 12 months offer is valid for all purchases of eligible products which are installed on or prior to September 28, 2012. IBM may withdraw this offer at any time. 4. Certified platinum by 80 PLUS Organization, 2010, visit www.80plus.org for more information. Direct link to certification: http://www.pluginloadsolutions.com/psu_reports/IBM_39Y7414_2980W_SO-188_%20Report.pdf. IBM hardware products are manufactured from new parts or new and serviceable used parts. Regardless, our warranty terms apply. For a copy of applicable product warranties, visit: http://www.ibm.com/servers/support/machine_warranties. IBM makes no representation or warranty regarding third-party products or services. IBM, the IBM logo, ibm.com and BladeCenter are trademarks of International Business Machines Corp. registered in many jurisdictions worldwide. A current list of IBM trademarks is available on the Web at www.ibm.com/legal/copytrade.shtml. Intel, the Intel logo, Xeon and Xeon Inside are trademarks or registered trademarks of Intel Corporation in the United States and other countries. All other products may be trademarks or registered trademarks of their respective companies. All prices and savings estimates are subject to change without notice, may vary according to configuration, are based upon IBM's estimated retail selling prices as of 15/05/2012 and may not include storage, hard drive, operating system or other features. Reseller prices and savings to end users may vary. Products are subject to availability. Contact your IBM representative or IBM Business Partner for the most current pricing in your geographic area. © Copyright IBM Australia Limited 2012. ABN 79 000 024 733. © Copyright IBM Corporation 2012. All rights reserved. IBMCA1394/BLADE3/APC/FPC



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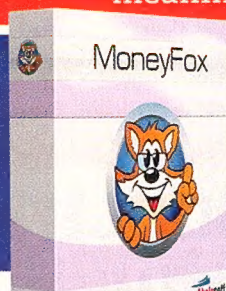
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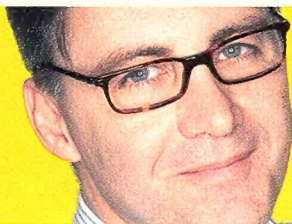
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SAMSUNG



editorial

TONY SARNO



WE PICKED HTML5 BECAUSE IF YOU WANT TO BUILD WEB SITES AND WEB APPS, YOU MUST KNOW IT

My recent point in a Q&A about our sister magazine *TechLife* (formerly *PC User*), that readers who didn't like it were welcome to switch to APC, was greeted with some alarm by a few APC loyalists. Did this mean that *PC User/TechLife* would get all the upgrades and multimedia goodies while APC would be left untouched as a classic PC magazine? And would APC just focus on PCs at the expense of the mobile and cloud technologies that are turning the IT world upside down?

So let me clarify. APC is about to get an upgrade, and while there'll be some instantly recognisable changes in the September issue, the general look and feel will remain largely the same. The idea behind the upgrade to APC is to further separate the magazine from *PC User/TechLife* and present you with two magazines that complement each other and give you a much wider perspective on tech than before, when *PC User* and APC often covered the same

ground. While *TechLife* is pitched at a broader consumer tech audience and covers how technology can improve your life, APC focuses more unashamedly on helping tech enthusiasts and professionals understand and master the latest tech. Our coverage will assume you have a reasonable knowledge of tech fundamentals so we can go deeper in explaining technologies and help you put them to good use for personal or work reasons.

I won't give away the changes because they're a surprise, but I think you'll enjoy them. One clue to what you'll see more of is the launch in this August issue of the masterclass on HTML5. I was going to hold it for the redesigned September magazine, but it really couldn't wait. Our masterclass on building Android apps finished recently and we couldn't leave it any longer without another. We picked HTML5 because if you want to build web sites and web apps, you must know it. tsarno@acpmagazines.com.au

APC AWARDS

We reserve the Editor's Choice and Highly Recommended award for the very best products available on the market.



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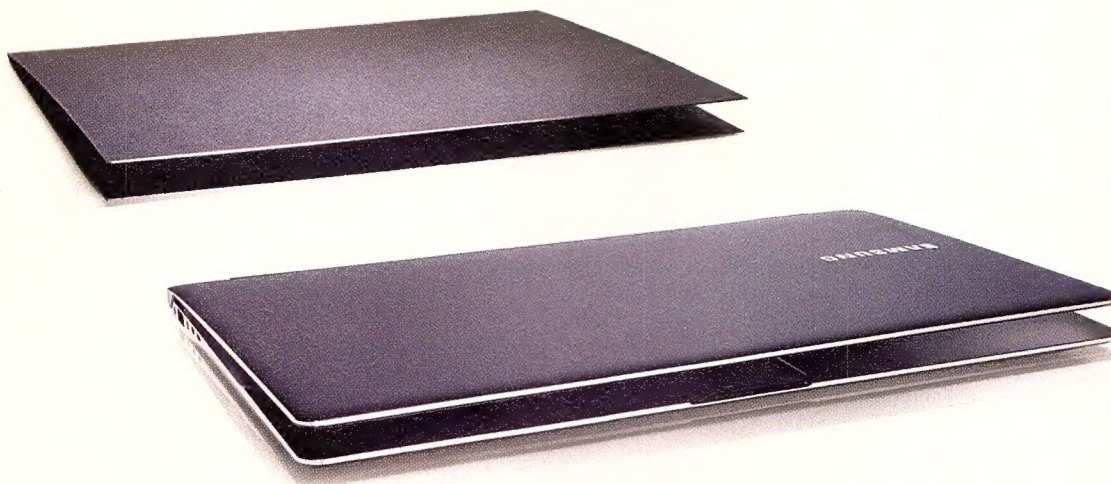
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Amazingly light
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A sheet of paper inspires our thinnest notebook yet.

However, this time it wasn't what was sketched or written down. One of our engineers simply folded a sheet of paper and thought that it was a really clean, slim-line look. And that's how Samsung's thinnest laptop was born, crafted from a single sheet of aluminium. Isn't it funny how often the best ideas come from the simplest places?

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Windows 7

SAMSUNG



ANDROID 4.1 OS

THE POWER BEHIND THE GOOGLE NEXUS

Darren Yates discovers that the new Android 4.1 OS will give the Nexus tablet the kind of consumer appeal Android rivals won't have.

Google's new low-cost Nexus 7 tablet has everyone talking, thanks to its rock-bottom pricing, but it's also the first and only tablet with the new Android 4.1 OS, codenamed Jelly Bean. Some earlier web reviewers have called the new Android merely a dot release, ignoring the fact that Google has cleverly upgraded what really matters, delivering a smoother UI experience, more flexibility for developers, improved networking and a massively improved home entertainment experience. It's clear that Google's Nexus will ooze more consumer appeal than other Android-based tablets.

NEW UI IMPROVEMENTS

Android's user interface experience has been a major focus this time around – the most notable improvement is universal Vsync timing. All screen draws and animation are locked to 60fps through a 16ms timing lock, regardless of excess CPU performance, which should smooth out the interface response and make it more consistent. The graphics have been further enhanced by the addition of triple buffering to ensure cleaner animated transitions as well. By the time you throw touch synchronisation in with the Vsync timing, Android 4.1 should offer the best user experience so far.

DEVELOPER GOODIES

Jelly Bean now offers resizable widget support. You're no longer stuck to a fixed matrix size on the home screen – developers can program widgets to adapt to the home screen space available and change content

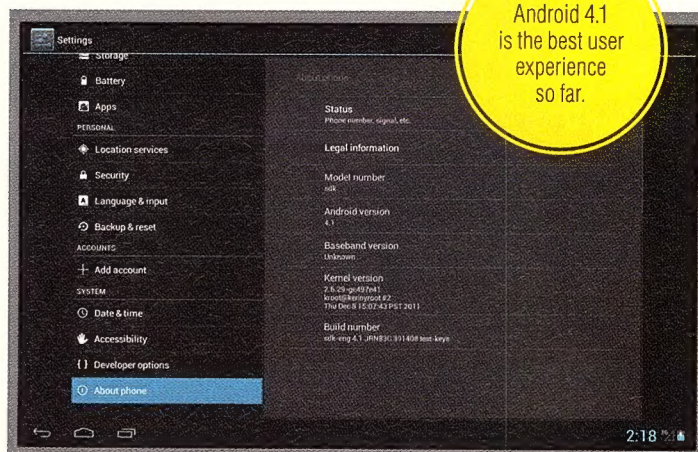
accordingly. Another nice add in the API (application programming interface) is the ability to query the device manager and find out the hardware goodies the device has and what each is capable of. One hope is this will help reduce the need for developers to limit device support when their apps appear on Google Play. Apps will have greater dynamic ability to check for features without developers having to resort to wholesale locking out of devices.

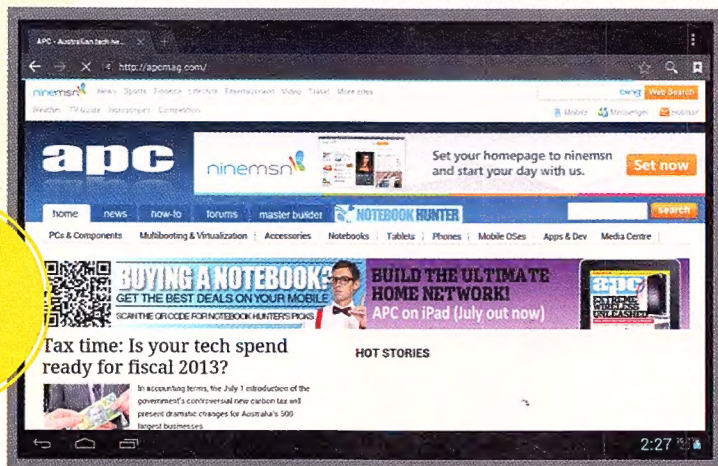
NETWORK CHANGES

Google's NFC (near-field communication) technology, Android Beam, allows supported devices to quickly transfer information, and was introduced in ICS (Android 4.0). In Jelly Bean, Beam now has the added option to switch from NFC to Bluetooth for faster and simpler file transfers. While we're on wireless networking, Jelly Bean adds a new option called 'pre-associated Wi-Fi Direct service discovery'. Wi-Fi Direct is Google's peer-to-peer Wi-Fi discovery and connect technology – like a high-speed version of Bluetooth. We first saw it in ICS, but it was somewhat limited in that developers could only show all nearby Wi-Fi devices, regardless of whether their services were relevant. That's been addressed in 4.1 so apps can now pre-check available Wi-Fi devices and only list printers rather than media players, for example, if your app wants to print something.

MEDIA CHANGES

And speaking of movies, the biggest news for Jelly Bean is the addition of multi-channel audio pass-through support on HDMI.





According to Google, games, music apps and video players will be able to use it and if the device doesn't support it, Jelly Bean will down-mix the channels to what the device has. Added to that, Jelly Bean has both encoding and decoding support for 5.1-surround sound AAC audio.

These are significant additions in light of Google TV and Google Play Movies. It should lead to watching movies with surround-sound audio rather than stereo only and is a must-have if Google wants to push into home entertainment. However, given Australia's continued use of MPEG-2 video compression in broadcast free-to-air TV, Google TV products will need codec support.

Still, Google has spent a bit of time working on the audio chain in Android 4.1 and the addition of audio pre-processing is an example. Apps will now be able to pre-process audio with filters such as noise and echo cancelling and automatic gain control before the audio is recorded. With higher-quality recording options in Vorbis and AAC available, it makes sense to improve the audio chain.

One of the more controversial inclusions is support for DRM (digital rights management) in Jelly Bean's media codec framework. While it's slightly irksome given the open-source roots of Android, the reality is Google is aiming to take on Apple's iTunes access to Hollywood movie rentals and Hollywood won't want a bar of anything that's not loaded up to its eyeballs in DRM.

SDK EMULATOR

Unless you get your hands on a Nexus 7, your first look at Jelly Bean will likely be through Google's Android Emulator. We had Jelly Bean SDK running in the emulator the day it was released and what surprised us was seeing it run a comparatively old Linux kernel in 2.6.29. Given the kernel is now past 3.2 and even most Honeycomb (Android 3.0+) devices are past this 2.6 stage, it's a bit disappointing and raises some questions as to which kernel will appear in devices like the Nexus 7.

TAKING ON APPLE AND MICROSOFT

All up, it's pretty obvious from these additions that Google plans to take on Microsoft and Apple in the lucrative home entertainment market. Multi-channel audio pass-through over HDMI and DRM support are dead giveaways and would neatly suit upcoming Google TV-based devices.

One of the things that has long impressed with Apple's iOS interface is how smoothly it operates. Jelly Bean's graphics additions from its universal Vsync locking, triple buffering and touchscreen sync-locking should make it look just as good.

Just one thing narks me though – given the Australian dollar is close to parity with its US counterpart, why for goodness sake are we being charged a \$50 premium for the Nexus 7? Let's hope the Federal Parliament's House of Representatives Inquiry into IT Pricing doesn't implode into a useless talkfest and the Australian IT Tax becomes a thing of the past. **ABC**

TOP 10 RECENT TECH FAILS

01 ANDROID ALLIANCE

Google introduces Android 4.1, while many 'partners' still to complete rollout of 4.0.

02 WP8 VS NOKIA

Microsoft announces WP8, but it won't run on partner Nokia's current top phones.

03 AMAZON WEB SERVICES

A storm brings down a Virginia Amazon data centre and Instagram and Pinterest. Huh?

04 CHROME FOR IOS

Uses the Safari engine and an older one at that. Slow, and Chrome-like in appearance only.

05 ADOBE FLASH

Flash is saying its goodbyes. Banned on iOS, it won't support Android 4.1.

06 SKYPE ADVERTISING

Microsoft announces it will insert display ads into Skype conversations.

07 FACEBOOK EMAIL SWITCH

Facebook substituted users' original email addresses with Facebook hosted ones.

08 MINITEL CLOSES

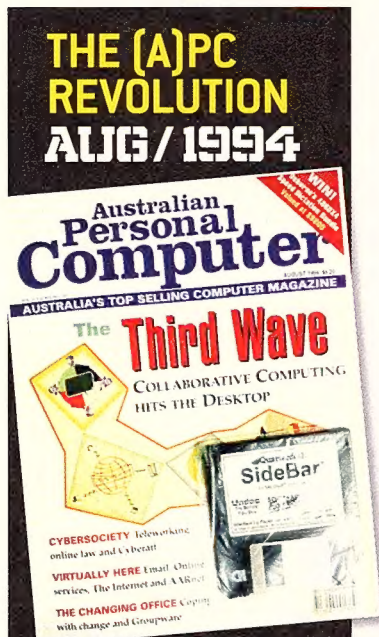
Not really a fail, but a dignified burial for the network that preceded the internet in France.

09 RIM TRAIN WRECK

BlackBerry 10 delayed until 2013...or forever?

10 FACEBOOK FIND FRIENDS

Another privacy outcry averted when Facebook dumped 'Find Friends Nearby' after just one day.



PERFECTOFFICE TO TAKE ON OFFICE

The newly upgraded desktop applications suite PerfectOffice 3.0 will be offered in three different versions, it was announced by newlywed parents WordPerfect and Novell. PerfectOffice Standard includes WordPerfect, Quattro Pro, Presentations, the PIM product InfoCentral, the workgroup publishing tool Envoy and the email, calendaring and scheduling tool Symmetry.

EPSON STYLUS

The Epson Stylus colour printer has set a new standard with the introduction of the first domestic-type 720 x 720dpi colour inkjet printer. It means you get a professional printer at a home user price of just \$1,199. The 720dpi benchmark image took eight minutes and 37 seconds to print out on the Epson Stylus. In short, at this price, it is the least expensive of the quality colour printers and easily outperforms any of its competition.



WINDOWS 8

MICROSOFT'S SURFACE TABLETS OMINOUS FOR OEM PARTNERS

Microsoft's surprise tablet announcement has left other Windows 8 tablet vendors with a bad taste in their mouths.

Microsoft's announcement of two Surface tablet devices: one with an ARM processor running Windows RT, and the other with an Intel Core processor running Windows 8 Pro, surprised everyone. Most of all, Microsoft's OEM partners. They didn't feature in Steve Ballmer's Surface launch speech, causing unrest among the companies supporting the launch of Windows 8. Was Microsoft trying to take a chunk of the hardware market for itself?

Other forthcoming Windows 8 tablets include the Samsung Series 5 Hybrid PC, and Acer Iconia W510 and W700. Acer was among the first to announce its hardware, and presented its tablets at the Computex event in Taiwan on 6th June. It described the higher-spec W700 as "The best-performing Windows tablet", suggesting that it did not yet know about Microsoft's plans for its own hardware.

Acer's vice president Oliver Aherns has been particularly vocal since the Surface announcement. "I worry that this will lead into a defocus internally for Microsoft, and then we have to suffer because we are working with their products," he told news agency Reuters.

When asked, Acer declined to comment.

And just days after the Surface presentation,

Microsoft announced the latest version of its smartphone OS. Windows Phone 8, also known as Apollo, is another step towards a unified Windows ecosystem, sharing many features and interfaces with Windows 8 proper.

However, there will be no upgrade path from Windows Phone 7, so customers will need to replace their current handsets if they want the latest features. If you've just bought a Nokia Lumia 800 or 900 (the WP7 phones par excellence), tough, you won't be able to run Windows Phone 8.

Some OEMs are trying hard to look as if they are taking this news in their stride. Samsung, maker of the Windows Phone 7-equipped Omnia 7, says the lack of an upgrade path has had no effect on its relationship with Ballmer's company. Others see Microsoft's furtive Surface announcement as not designed to capture a section of the hardware market for itself, but to stimulate consumer interest in Windows 8 and keep its OEM partners on their toes – goals it has clearly accomplished.

We thought the Surface tablet was Microsoft wanting to make sure it can compete on an equal basis with Apple. If it's the latter, the OEM partners should be worried. **ANC**



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12 gadgets

BY ANNA FINNERTY

iRig Mic

I won't be auditioning for season two of *The Voice*, but I once fancied myself a decent singer and even sang with a band. We spent bucketloads of cash in recording studios and, when money was tight, we recorded tunes on dodgy old cassettes. It would have made such a difference if we'd had an iPhone and a mic. The iRig is a quality condenser microphone you plug in to your iDevice for recording professional audio (think singing, speeches and podcasts). It works close up and at a distance, has a wide dynamic range and comes with cool voice effects.

\$80

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\$480

Beats by Dr. Dre Studio High Definition Powered Isolation Headphones

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Yo! Join the ranks of P. Diddy, David Guetta and Lady Gaga by donning Dr. Dre's seriously dope headphones. Made for the masses, these colourful scratch-resistant headphones have lots of smarts built in and major street cred. Noise-cancelling technology helps shut off the outside world, while a high-powered amplifier gives you wicked audio. They're made with mobile phones in mind – the cable has a built-in mic and call answer button – and they fold up to a compact size.

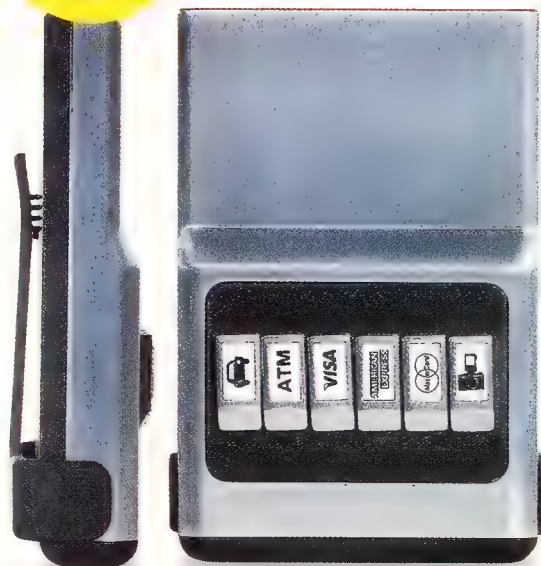


ACM Wallet

I'm all for the convenience of the new pay-Wave credit cards, but I'm uncomfortable with the idea of falling prey to electronic pickpockets and identity thieves. That's why I want an ACM Wallet. Cards are stored in their own protected slot (to prevent damage and demagnetisation), and are retrieved at the push of a button. The brushed aluminium wallet is available in a variety of colours and styles, holding 6 or 12 cards. The six card unit weighs only 57g. The company also backs its product with a limited lifetime warranty and a 30-day moneyback guarantee.

\$50

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\$699

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Bose Wave Music System III

No, it's not a typo, this little radio/CD player is expensive, and you don't get a whole lot of features for your money. There's a radio tuner, CD slot and dual alarms, but there's no Bluetooth connectivity or iPod dock – those options come at a price. So what makes the Wave compelling? It's the sound quality. This little clock radio is packed full of Bose's patented audio goodness for deep, rich sound. There's also a digital version available for \$799 for accessing DAB, DAB+ and T-DMB signals.



\$180

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ONLINE www.logitech.com

Logitech Fold-Up Keyboard

There are plenty of keyboards out there for your tablet, but we've had a hard time finding one that's not cramped. The Logitech gets a nod for being a full-sized keyboard that's still compact enough to fold up and stash under your iPad. It's ready to use as soon as it's unfolded, and it turns itself off when packed away to save power. When open, it also doubles as a stand, holding the tablet at a comfy angle. Like most good tablet keyboards it's Bluetooth enabled, and it charges via USB so you don't have to plug it in before leaving the house.

Parrot DIA

Taking cues from slide film and light boxes, this 10.4in photo frame is like no other I've seen. Images are displayed on a glass panel that sits a couple of centimetres in front of a bright white light. Images become translucent and the effect of the white light shining through them is quite amazing.

You connect to the DIA via Wi-Fi, Bluetooth or USB – you can even send images to the frame's own email address.

The DIA's fancy French designers babble on about its 'prestidigitation' and its 'poetic aesthetic'. I don't care what they call it, but after seeing the DIA, I don't think any other photo frame will do.



FROM \$549

CONTACT Parrot
ONLINE www.parrot.com/dia/en

AMD TRINITY

Jeremy Laird meets the mobile processors AMD hopes will take the fight to Intel and dethrone Apple's MacBook.

AMD has officially unveiled Trinity, the second generation of its accelerated processing units (APUs). It's a microarchitecture AMD hopes will take the fight to Intel's Ivy Bridge processors and let it challenge for a share of the lucrative ultra-thin laptop market currently controlled by Apple's MacBook.

The Trinity line will launch in five models – three aimed at mainstream laptops and two targeting the coveted ultra-thin market, with designs for desktops and all-in-one PCs to follow later on.

AMD claims battery life of up to 12 hours in a 'resting' state. That's an impressive figure, especially coming from a processor manufactured on the larger 32nm process compared to the 22nm chips Intel adopted for its Ivy Bridge processors.

PILEDIVING POWER

AMD is squeezing power efficiency out of a 32nm chip, thanks to its new Piledriver architecture. Built on the Bulldozer foundation, it's had notable improvements

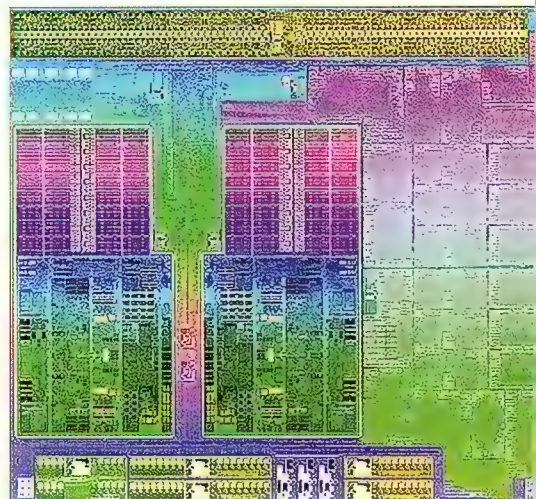
to its dynamic power management between the onboard CPU and GPU, which has resulted in a 29% performance increase.

This translates to faster start-up times: 2 seconds to resume from sleep and 10 seconds for the initial boot to desktop, but it also has clock speed enhancements.

The quad-core 25W chip has a default CPU speed of 2GHz that can jump up to 2.8GHz at a pinch, while the dual-core 17W chip can bump from 2.1GHz to 2.6GHz. In terms of Trinity's onboard GPU, AMD has equipped the Trinity processors with its Radeon HD 7000 line to give it a significant graphical boost.

AMD claims a performance edge against comparable Ivy Bridge processors of up to 150% in mainstream games like *Starcraft 2* and *DiRT 3*, though that should be taken with a grain of salt, since AMD's figures haven't been substantiated by third-party benchmarks. Even so, given AMD and Intel's respective histories, it's fair to expect Trinity processors to

At the heart of AMD's Trinity is a Bulldozer core.

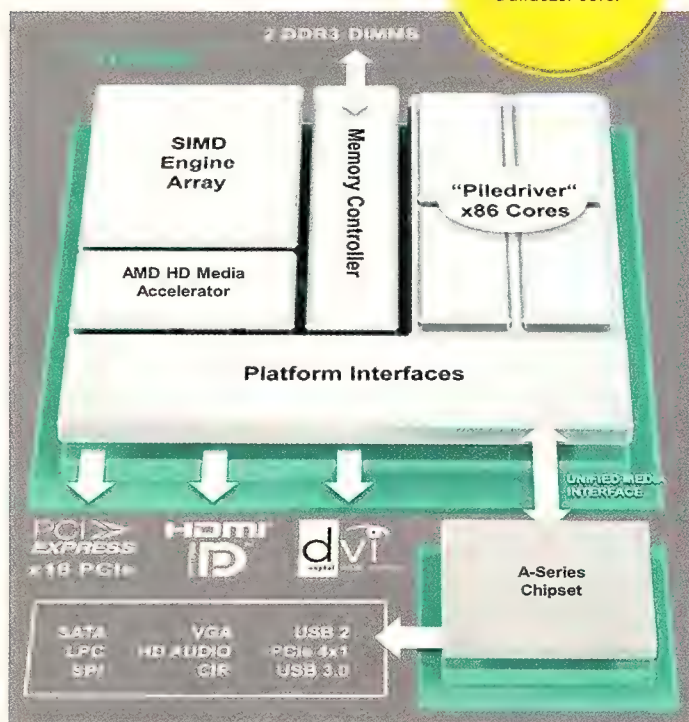


have a respectable edge. The final factor for AMD's Trinity processor is price, which is where the processor shines brightest.

THE VERDICT

Our main concern with the new AMD A10-4600M has been that its Bulldozer-derived CPU cores might be a step backwards in performance terms compared to the fully quad-core Llano processors it replaces. We needn't have worried. It's not a huge step forward, but it is quicker.

However, the real advance involves the graphics core, which is increasingly what matters most in mobile devices, and the AMD A10-4600M delivers a big advance in



GETTING HANDS ON

To help us form our opinions, AMD sent us an early 'white book' laptop running an A10-4600M. Firing it up for the first time was exciting stuff. The key reference points here are AMD's outgoing A8-3500M and one of Intel's dual-core Intel processors for ultrabooks, such as the Intel Core i7-2637M.

On the CPU side, we can make a direct comparison, but in terms of graphics it's much harder, thanks to our comparison systems having discrete GPUs on board. But with those provisos noted, let's see the results. First up is the Cinebench 11.5 professional rendering benchmark. The new AMD chip knocks out a score of 2.06. This is faster than the older AMD A8-3500M, which manages just 1.89. The Core i7-2637M, meanwhile, achieves 2.23.

Moving to game performance, we ran *Elder Scrolls V: Skyrim* on our test machine, which is a very expansive and graphically pretty game, as long as you use high-resolution texture packs. Once configured and running at high-detail settings with antialiasing disabled, we were able to achieve a very healthy and playable 46fps at 720p.

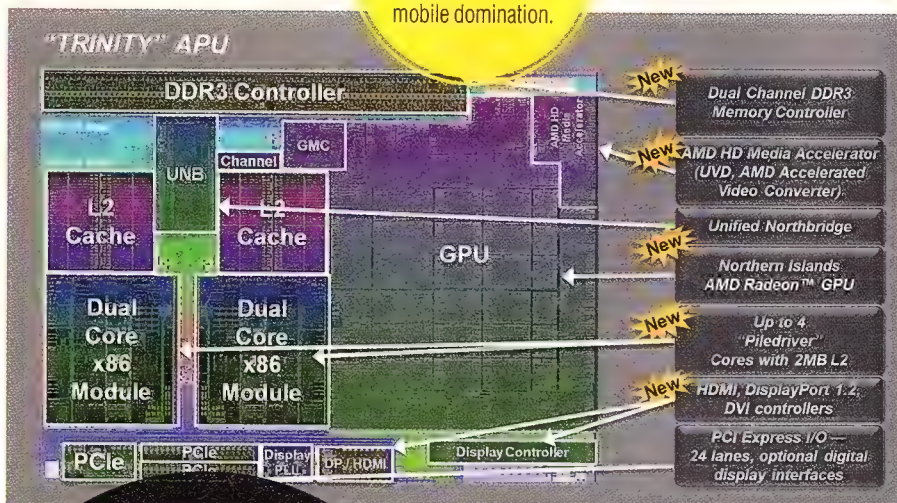
Upping the ante to the game's ultra setting, 4x antialiasing and a screen resolution of 1,366 x 768 pixels and we still got a near-playable 25fps. No previous integrated graphics core comes close to this. Even Intel's latest HD 4000 core, as found in the new Ivy Bridge family, is barely half as fast.

AMD has pushed its technology hard in the hope of overtaking Intel in the race for mobile domination.



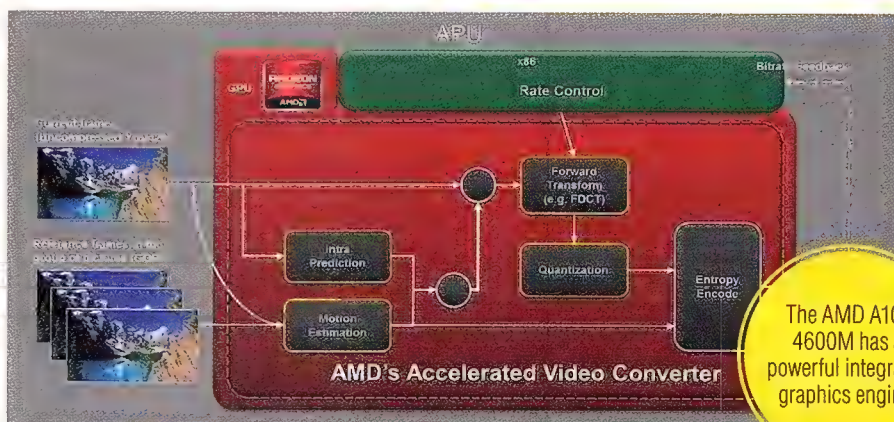
MEET OUR TEST MACHINE

The new AMD A10-4600M isn't a processor you're likely to buy separately. Instead, it will be part of a portable PC of some kind so the specifics will be blurred by the platform into which it's inserted. The first laptops with the chip aren't ready for retail, so AMD provided us with a whitebook system that's used for evaluating the underlying platform. It's a 14in system with a TN panel and 1,366 x 768-pixel native resolution. AMD has fitted a Samsung 830 Series SSD and 8GB of RAM, so there should be little holding the chip back.



STAR OF THE SHOW

As for the AMD A10-4600M itself, it's nominally a 2.3GHz chip manufactured using the same 32nm production process as both Llano chips. As an overall proposition, then, it combines AMD's latest CPU design with its most advanced integrated graphics ever in a package that might just offer one of the most compelling compromises between power consumption, price and performance. It is a pity we couldn't get our hands on a final test machine but the whitebox shows off its potential talents.



The AMD A10-4600M has a powerful integrated graphics engine.

graphics terms. It's the fastest integrated graphics core currently available. More importantly, it makes playing modern games at medium settings a real possibility. For gamers on a tight budget wanting a portable device for casual gaming away from home, AMD's new fusion chip is very exciting.

At this early stage it's difficult to draw conclusions on the resulting battery life. But if this evaluation platform is anything to go by, it certainly looks promising. Relieved as

we are by the CPU performance of the AMD A10-4600M, this first showing suggests that the revised Piledriver architecture isn't going to frighten Intel in a broad sense. Unfortunately, AMD needs a fundamentally new architecture to achieve that.

FINAL ANALYSIS

It's been tough going for AMD in the conventional x86 chip market of late. The company's long-awaited Bulldozer

microarchitecture was a particular disappointment on the desktop, but AMD is looking more competitive in the mobile segment.

The new AMD A10-4600M has the makings of a very successful chip for thin and light laptops. Buyers after affordable laptops in the ultrabook idiom but with better graphics performance should consider the first batch of laptops with this impressive little chip inside. **BTTC**

FreeNet Antennas

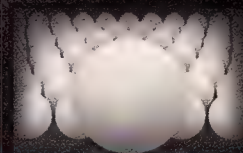
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FUTURE TECH ON SHOW

If you want to know what comes next in tech, Taiwan's annual Computex expo is a great place to find out. **Bennett Ring** hit the show floor to uncover the devices, software and trends to shape the next year and beyond.

Each year the world's hardcore hardware geeks leave their cool air-conditioned environs for the annual pilgrimage to Computex in Taipei, the world's largest PC component expo. While the hot and humid conditions wreak havoc with our fragile nerd-frames, the wealth of hardware on show makes it well worth it. As usual, this year's Computex had booth after booth jam-packed with cheap cases and generic PSUs, but with the impending arrival of a new Windows OS it turned out to be one of the most interesting shows in recent memory. APC spent three days trawling the floor to find the hottest trends for the next 12 months, and here's what we found.

WINDOWS 8

No points for guessing that Microsoft's touch-tastic OS stole the show. While it might not offer much for mouse-clicking, keyboard-clacking desktop users, the new Metro interface is a godsend for tablet and notebook makers. Microsoft didn't use the show to launch any new information about the OS; it's still coming in October, and we still don't know exact pricing.

Thankfully there were plenty of hardware vendors who did announce products purpose-built for Windows 8's Metro interface; in fact, it was impossible to pass any of the major manufacturers' booths without seeing a cornucopia of portable devices tailored for Windows 8.

One of the most interesting was the new ASUS Taichi ultrabook. A quick glance reveals a relatively run-of-the-mill ultrabook, albeit with a very shiny lid. However, a quick button tap brings this shiny lid to life as a second monitor, allowing the Taichi to operate as a tablet with the lid closed, or a laptop with two screens when opened. We're not sure how practical this will be in the real world, though it does

open interesting possibilities for group presentations. We didn't buy the ASUS demo showing a mother using the laptop while her daughter watched a movie, as that would require very precise monitor positioning.

During a closed-door demo, Nvidia briefly showed off a tiny Windows RT tablet running on the company's Tegra 3 ARM processor. Meanwhile MSI used the show to reveal the Slider 20 Windows 8 hybrid, armed with a unique fold-out keyboard that converts it from tablet to laptop mode.

Acer impressed with the 27in all-in-one 7600U, a beautiful slab of touch-display that can read a whopping 64 simultaneous touch points at once. The screen rotates 90 degrees into portrait mode, making it officially the world's biggest ereader.

TABLETS

It was impossible to venture more than two metres without tripping over yet another tablet PC, which must be heartening to Microsoft after pushing slate PCs so many moons ago. The vast majority were running Windows 8 preview code, which seemed to work well until we actually tried to do anything other than simply slide the front menu screens around.

One of the most impressive tablets on offer was the Acer Iconia W700, with its large 11.6in 1,920 x 1,080 HD display that

comes with an interesting cradle for desktop use. It also packs a Thunderbolt connection, another of the trends we noticed at the show, as well as a few USB 3.0 ports. Most impressive of all, though, is the inclusion of an ultra-low voltage Ivy Bridge processor, promising vastly improved performance over similar ARM or Atom powered designs.

Not to be outdone by Acer, ViewSonic showed off the world's largest tablet, the gargantuan 22in VCD22. It's not strictly mobile, thanks to the lack of a battery, but it was definitely one of the more interesting Ice Cream Sandwich tablets at the show.

Like many of the noteworthy tablets, the ASUS Tablet 600 is a transforming device. A separate keyboard plugs into the base of the tablet, turning it into a fully fledged ultrabook. Not only does the base deliver a full QWERTY keyboard, but the additional battery pack blows the battery life out to an amazing 18 hours. Powered by Nvidia's Tegra 3 processor, we



The ASUS Taichi (left) and Acer 7600U are purpose built for Windows 8, which stole the show.



The Acer Iconia W700, with its large display and unusual cradle.

Thunderbolt was a big trend we noticed this year.

The Corsair AX 1200i stood out, with its digitally controlled power circuitry.

were very impressed by the snappy performance of Windows RT (the ARM-compatible version of Windows 8).

DIGITAL POWER SUPPLIES

It seemed there were an infinite number of power supply manufacturers at the show, all touting hugely efficient 1,000W models. To be honest, they all blurred into one after a while. However, Corsair's impressive new AX1200i stood out from the pack. It's the first consumer PSU to include digitally

controlled power circuitry. According to Corsair, this delivers much more stable and responsive energy to your system, but we were most impressed by the amazing Windows interface. The PSU connects to your motherboard via USB, and feeds real-time information about total system energy use to the Windows monitoring software. You can even see which rails are carrying the load, and switch from a single +12V rail to multi-rail mode.



Acer's touch-enabled Aspire S7 has a unibody and stunning 1080p display.



Cases were everywhere. The standout? The ASUS Tytan CG8890, with slide-open sides.



We've got one on the way for review – keep your eyes peeled for an August release date.

THUNDERBOLT

Intel's speedy new interface put on a decent show, with most high-end motherboards including a single Thunderbolt port. Gigabyte showed off its Z77X-UP5 TH motherboard with dual Thunderbolt ports, and gave us a real-time demo of how it can be used to deliver extraordinarily fast external storage for video editors. The manufacturer also shared with us its greatest concerns for the technology – the cost of cables.

According to our Gigabyte PR rep, Apple controls the licence for the cables, and it's keeping a tight rein on the technology. A single 1m cable will set you back around \$70, while the experimental 25m version we saw, \$400. Good thing mere mortals have USB 3.0 to play with. MSI had the most interesting Thunderbolt device, an external GPU powered by Thunderbolt. Looking just like an external hard drive, unfortunately we couldn't find out which GPU is used within, but the 75W power limit of Thunderbolt could be a determining factor.

High-end gaming laptop the ASUS G75, with 802.11ac, or '5G'.



802.11AC

While 802.11ac won't be officially ratified until the first quarter of 2013, Qualcomm Atheros used the show to demonstrate a range of devices based on the new standard. Available in 1, 2 and 3 stream versions, Qualcomm claims that these new routers deliver up to three times the real-world bandwidth of 802.11n per stream.

The new 802.11ac devices also include Bluetooth 4.0. Just as we saw with 802.11n, devices using 802.11ac should be selling well before the standard is formalised, in the second half of this year. ASUS was one of the few companies at Computex to display an 802.11ac device in the high-end gaming laptop G75, which ASUS is referring to as 'the world's first 5G Wi-Fi laptop'.

PC CASES

When we weren't stubbing our toes on tablets, we were grazing our shins on PC cases – and there were plenty of interesting boxes to see. BitFenix launched its new Ghost case, using 'Serenitek' to dampen internal fan noise, an approach that many silent case-makers also showed off over the week. SilverStone's amazing Sugo O9 small form

factor case had us mystified, offering space for dual video cards and a huge CPU heatsink inside a tiny shoe-box sized case.

While it's not being sold separately, the new case used in the ASUS Tytan CG8890 gaming PC was hard to miss. In normal mode it looks like a run-of-the-mill gaming case, but hitting the automatic overclock button causes the sides and top to automatically slide open, revealing additional air ducts. Gimmicky? Maybe. Cool? Definitely.

ULTRABOOKS

Whether they were ultra-thin laptops powered by AMD, or ultrabooks powered by Intel, it was impossible to ignore the industry's push behind ultra-portable laptops at Computex. With the segment firmly established, this year's models were all about evolving the platform. And with

Windows 8 just around the corner, it was no surprise to see most of the

MSI's GT70, one of three laptops to adopt Nvidia's Kepler GPU, for gaming on the go.



Roccat's project Phobo — note the smartphone dock.

Search of Incredible



major manufacturers showing off touch-enabled ultra-portable laptops.

Acer's Aspire S7 series is the first touch-enabled ultrabook from the company, and we loved the gorgeous unibody chassis, wrapped around a stunning 1080p display. Gigabyte wasn't going to be outdone, using an expensive carbon-fibre chassis on the new X11 ultrabook. Meanwhile ASUS demoed the new UX21A, very similar to the recently announced Zenbook Prime range, but now incorporating a touchscreen. Dell dropped touch control to deliver a rock-bottom price for its new 14z ultrabook, which should hit shelves at around \$700. Finally, Samsung showed off several touch-ready versions of its new Series 5 ultrabooks, packing potent Ivy Bridge processors.

While most ultra-portable laptops at the show used Intel's Ivy Bridge processor, AMD returned fire with the launch of its Brazos 2.0 platform, using the new E-series APU processors. These are not based on the new Trinity APU, instead being minor product refreshes of the existing Brazos platform, with the APU using the same die but with slightly higher clock speeds.

KEPLER ON THE MOVE

We've known all along that Nvidia's Kepler GPU design was built with an eye towards mobile gamers, but it wasn't until Computex that the flagship GTX 680 made its way into gaming laptops. The GeForce GTX 680M promises to redefine mobile gaming, arriving first in the MSI GT70 and Alienware M17x/M18x products. Despite its relatively low power requirements, all three laptops are bruisers, and we noticed significant fan noise in our hands-on time testing them. But we can't deny just how incredibly good *Max Payne 3* looked on all of these systems.

SINGLE PACKAGE ICS

Gigabyte's private booth was dominated by a live display showing off its new IR3550

PowIRstage ICs, used to deliver the power to its new Ultra Durable 5 range of motherboards. Until now, motherboard manufacturers have had to use a variety of different MOSFETs and drivers to deliver a single power phase, and each of these components were built by different companies. This in turn led to inefficient operation, raising the temperature of the motherboard's power circuitry.

However, the new IR3550 contains all of these components in a single integrated circuit, and Gigabyte claims it can reduce temperatures around the CPU by up to 60°C when overclocking.

These new power chips are not cheap though – we heard rumours they can incur a considerable cost increase to each motherboard, so it will be interesting to see how the Ultra Durable 5 boards are priced. While Gigabyte will be the first to market with motherboards using these new components, expect ASUS, MSI and the rest to follow suit shortly after.

GAMING ACCESSORIES

As the consoles continue to roar towards dinosaur-hood, PC gaming is booming in 2012, and there are plenty of savvy manufacturers looking to make a buck out of cashed-up PC gamers.

We lost count of the number of gaming mice and keyboards, but one in particular struck us as pure genius. Roccat's project Phobo is a standard gaming keyboard with a very unusual feature; a smartphone dock on one end. Using the included Roccat software, users will be able to use their iOS or Android phone as a small touchscreen on the keyboard, launching macros and monitoring system health.

Even better, phone calls are then piped through the keyboard's Bluetooth, so as to deliver your calls through your gaming headphones. It's a miracle nobody's thought of this before! **BTTC**

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HAVE YOUR SAY

EXCLUSION ZONE

But not for forever.

I read in the June issue (page 22) about the changes to *APC*, 'Will I continue to get *APC* on tablets?' and the answer, that the *APC* electronic version will be available on Android tablets and not just the iPad. Hooray! Finally, recognition that the iPad isn't the only tablet in the world worthy of an electronic version of the magazine. Hold on a minute – then, with disbelief, I read that a company-wide deal will see it only available to Android tablets if they happen to be made by Samsung! What the heck is going on here? What an insult to all

other Android tablet users out there. *APC* should be ashamed of itself for excluding the majority of Android tablet users from the electronic mag so they can get some sort of corporate sponsorship. My ASUS Transformer and I are feeling left out. Isn't it hard to be independent when you can be influenced by a single manufacturer, *APC*?

Brett Martin
Wodonga, Vic

*Editor replies: Brett, expect to see *APC* and other magazines available for all devices through Google Play in the near future.*



DON'T CHANGE!

I'm a former *PC User* reader who has made the shift to *APC* after *PC User* morphed into *TechLife* and I want to just say please don't screw with this magazine as well. It's a good solid PC magazine and if you add some more Test Bench-like comparisons and expand your Help Station-equivalent, 'How to', you won't be far off what made me like *PC User*. Leave the smartphone and tablet coverage and general wankery to *TechLife* and just focus on the PC and you'll keep me happy.

Peter Randall
Melbourne, Vic

BEST. MAG. EVER.

Hello *APC*, I just picked up the first issue of *TechLife* after you devoted so much space to it in the June issue and to be honest,

it blows you guys away, which is weird because it seems to have the same editor-in-chief. *TechLife* is the best tech magazine in Australia by a country mile and would stand up in any company, including my other favourite mag, *Wired*. Which then begs the question, what's going on with *APC*? Don't we loyal *APC* readers also get to see a refresh, or at least some augmented reality videos like in *TechLife*? You said in your Q&As about *TechLife* that *PC User* readers who didn't like *TechLife* should migrate to *APC*, so does that mean *APC* is doomed to forever sit in amber while *TechLife* covers all the other post-PC tech and gets all the attention?

Tim Roberts
from the internet

*Editor replies: *APC* is also getting*

*a makeover – see the editorial – but this won't be a shock to the system like *TechLife*.*

LINUX IS LAME

Are you serious? You've devoted the entire July disc to Linux Mint and you even dropped the toolkits to make way for it. What's the love for Linux? Last I looked on Wikipedia, it had a 1.66% share of the entire OS market (and that's a generous share, on other sites it goes down as far as .78%). Despite this, it still gets the cover disc, when probably 98% of your readers are Windows users. You're not looking after your main audience by catering for those sad Linux souls that futz around with an OS that's going nowhere.

John Randall
from the internet

Editor replies: John, you're being unfair. We carried the Windows 8 release preview just before that (and got into trouble from Microsoft for not clearing it with them) and I'm sure many of our readers with Windows also like to check out the other OSS.

MORE MACS PLEASE

Recently, Apple's Mac has become even more popular. What I'd like to ask is why *APC* never even mentions Macs. I mean, *APC* mentions Linux (nowhere near as popular as Mac) but not Mac? Why not talk about OS X Mountain Lion instead of the crap 'Linux Mint' and 'Ubuntu'?

Jonathan Liu,
Revesby NSW

*Editor replies: I agree that Apple Mac deserves more coverage in *APC* and it's coming. **APC***

EPINIONS@APCTEST.COM

Come on, have your say!

We want to hear what you think. Add to these discussions or email your views (in fewer than 250 words) to epinions@apctest.com. All correspondence becomes the property of *APC* and is subject to editing. Letters must include full name, street address, suburb, state and phone number to be considered for print publication. Address and phone details will not be published.



ANALYSTS WRONG ABOUT IPHONE

'Experts', who should know better, are still making silly predictions — even after the lessons of the iPhone back in 2007.

End User was taken aback recently when we read a prediction by the respected research firm International Data Corp (IDC) that Microsoft's Windows Phone, currently with around 2% of the market, would become the second most popular phone OS by 2016, behind Android. Yes, even ahead of iOS on the iPhone.

Are IDC for real? If this prediction eventuates, we solemnly promise an APC staff member will go for a swim in the Yarra in the middle of the Melbourne winter in 2016 — without a wetsuit.

IDC based its prediction on the assumption that Microsoft partner Nokia will run versions of Windows Phone on lower-end phones that it will sell in the millions to emerging markets. It

ignores the fact that the iPhone 5 will probably be the biggest product announcement in tech history and should easily surpass the crazy sales that Samsung is achieving with its Galaxy S III (Samsung says it will sell 10 million units by the end of July).

IDC's slapping of iPhone in the face also reminds us of the many 'gurus' who said the iPhone would fail when it arrived in June 2007. First up, making probably the most catastrophic call in the history of tech, was RIM co-CEO, Jim Balsillie, who said that the new iPhone was simply not a threat to the BlackBerry. "As nice as the Apple iPhone is, it poses a real challenge to its users. Try typing on a touchscreen on an Apple iPhone — that's a real challenge. You cannot see what you type," Balsillie said, confident

that his physical keyboards would repel any challenge from Apple. Consequently, RIM didn't take the iPhone seriously enough and now is a basket case.

Another misguided guru was Microsoft's Steve Ballmer, who dismissed the iPhone, saying "There's no chance the iPhone is going to get any significant market share. No chance," and predicting it would end up with only 2-3% of the market. This was a terrible underestimation, which forced Ballmer to play catch-up with WP7 and, ironically, gave him that 2% market share.

More independent analysts who should have known better because they weren't biased by a competitive mindset still got it horribly wrong. Ashok Kumar, with investment analysts Capital Group, told investors that the

iPhone was like a squib, a reference to the Harry Potter books in which a squib is the offspring of a witch and wizard who can't produce magic.

Renowned pundit John Dvorak, whose job is to be an expert on technology, argued that Apple should pull the plug on the iPhone, because there was no way it would be able to compete with Nokia and Motorola. "There is no likelihood that Apple can be successful in a business this competitive," Dvorak said firmly. Another media analyst, Matthew Lynn, said, "The iPhone is nothing more than a luxury bauble that will appeal to a few gadget freaks." To its credit, Bloomberg still has his entire article, 820 words of elaboration of this calamitously wrong prediction, at <http://bloom.bg/Ncz3Bk>. **END**

ENDUSER

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TONY SARNO — EDITOR

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A SERVER FOR HOME

After languishing in obscurity for years, the home server is an idea that's finally ready for the limelight and can provide a powerful control centre for all your PCs and gadgets. APC reveals the hardware and software you need to buy or build — and supercharge — your own.

The home server has a pretty bad rep and a poor sales record. After a lacklustre reception over the past five years, it's an idea that's all but been abandoned by major PC vendors like HP, Dell and Acer (if they embraced it in the first place) — but that doesn't mean that it's necessarily a *bad* idea. We won't argue, however, that it was perhaps a poorly timed one. A lot's changed since the first commercial home servers (running Windows Home Server 2008) were released five or so years ago, however — and if anything, there's a much more compelling argument for the concept in 2012 than there was back in 2007. We live in an age of multiple-PC households, where most family members have at least one laptop or desktop to their name, not to mention a smartphone or tablet as well, and all that really demands a centralised place for storage and backup.

While a NAS can fill both those roles nicely, what makes the home server concept so appealing is the incredible flexibility it offers.

Beyond the basics, running a home server with a genuine OS (be that Windows or Linux) will let you choose from a much wider array of software and services, and doesn't tie you to the often limited or cut-down apps you'll find on a NAS. If you want a single spot to manage the family's downloads, store backups, transcode media files for playback on all your devices (from smartphones to TVs, tablets and games consoles), or even set up a video camera surveillance system, a home server can do all that and more.

A home server doesn't have to be big or expensive either. HP's MicroServer N40L (see page 27) proves that you can build a small feature-packed server box for less than the price of a competing NAS. Spend a little more and you can get a much more powerful system capable of handling more demanding work. And of course, repurposing an old laptop or desktop to act as a server is a great way to re-use hardware. The options, and the possibilities, really are wide open. It's time you gave the home server a second look.

AFFORDABLE SERVERS FOR HOME OR OFFICE

Small servers have crashed in price over the last few years and often deliver more power and flexibility than similarly-priced NAS boxes. **Bennett Ring** tests a selection that proves you don't have to be big to pack a lot of punch.

As the number of connected devices in the home continues to explode, the need for a home network has never been greater. With so many tablets, laptops, media extenders and other multimedia-munching devices creeping into every room of the house, it makes sense to have a centralised storage device to host all of your movies, .MP3 files and work documents across the network. The cheapest option is a simple NAS (Network Attached Storage) drive, and the fancier models even include a DLNA server for media streaming. However, if you're willing to spend a little more, a true home server provides a much more robust solution. With a home server you need never concern yourself with transcoding your media into different formats for each device; simply install software that does the job on the fly. Automated backups of your networked PCs are easier than ever, and upgrading your storage couldn't be simpler, thanks to the inclusion of hot swappable drive bays. You can even sync your server with cloud storage, providing the ultimate in data protection, keeping your happy snaps safe even during the inevitable zombie apocalypse.

Over the last few years, we've seen the budget range of home servers plummet in price, while high-end offerings deliver more power and space than ever before, benefitting from the range of low-power CPUs and terabyte-spanning drives now on the market.

The biggest evolution though was the release of Windows Home Server 2011 in April 2011, a 64-bit only OS designed for home or home-office servers. The removal of Drive Extender, a very popular feature of the original Windows Home Server OS, caused an uproar among enthusiasts, but since then a variety of third-party add-ons have restored this functionality. Whether you're paying \$300 or \$1,500 for a SOHO server, there are plenty of options tailored to suit your unique computing environment. Figuring out which one you need isn't easy though, so let's take a look at important questions you should ask when trying to decide which server will serve your needs best.

WHAT TO BUY?

Your first decision is which OS you'll go for. Windows Home Server 2011 is the most popular choice for home media networks, but other options include Windows Storage Server 2008 R2 and Windows Small Business Server. If you're looking to run a handful of clients, as well as

being able to install lots of third-party apps, we'd suggest Windows Home Server 2011, while Storage Server 2008 R2 excels at pure file distribution to a large range of clients. Small Business Server is designed more for offices with between 25 and 75 clients. Let's not forget the many, many Linux server OSs, such as Amahi, but they're definitely trickier to set up if you don't have any Linux experience. Having said that, many server admins swear by Linux, and there's a reason it's so popular in commercial serving environments.

Like any computer, the speed of its components will have an impact on performance. If you simply want to share files to a small number of clients, a low-speed CPU will do the job fine. However, if you need to do media transcoding to multiple clients, you'll need all the MHz you can get. Likewise with memory; the more included, the better the server can handle multiple clients. Hard-drive speed and interface is also important in more demanding environments.

Spare drive bays are always desirable. Hot swappable bays offer the ultimate in convenience, while RAID support ensures data security. Finally, USB ports are also handy for your network attached devices, such as printers or security cameras.

Ultimately your decision will come down to how many clients you need to run, as well as the tasks they'll be running. We imagine most homes will have around five clients with multiple streaming requests at once, and a mid-range home server should handle this moderate workload admirably. We've taken a look at four servers aimed at the SOHO market, from the cheapest home media servers up to powerful mid-range servers designed to tackle even small office environments.

SIMULATED BACKUP NETWORK TRANSFER SPEED

	Average read speed (MB/s)	Average write speed (MB/s)
Acer AC100 2TB	50	49
Lenovo ThinkServer TS130	52	39
WD Sentinel DX4000 4TB	38	38
HP ProLiant MicroServer G7 N40L	28	31

X264 HD BENCHMARK

	Pass 1 (fps)	Pass 2 (fps)
Acer AC100 2TB	37.74	9.24
Lenovo ThinkServer TS130	41.18	9.7
WD Sentinel DX4000 4TB	n/a	n/a
HP ProLiant MicroServer G7 N40L	9.51*	1.82*

*Tested with 32-bit version; see review for details.

SUSTAINED NETWORK TRANSFER SPEED

	Average read speed (MB/s)	Average write speed (MB/s)
Acer AC100 2TB	51	60
Lenovo ThinkServer TS130	40	62
WD Sentinel DX4000 4TB	41	54
HP ProLiant MicroServer G7 N40L	45	32



\$1,385



Acer AC100 2TB

Don't let this server's diminutive size fool you.

@ www.acer.com.au

✓ Plenty of performance, lots of USB ports, tiny form factor.

✗ Rather expensive, only software RAID.

As the smallest server in the roundup we could be forgiven for thinking this little box would lack the oomph of its bigger brethren. Yet Acer's claims of bringing the data centre to the desk aren't so far-fetched after all, with this potent little powerhouse offering breathtaking performance. At just 200 x 200 x 205mm, this box will comfortably fit behind the widescreen monitor on your main work desk, and the VGA out means you can operate it directly without having to log in via another networked PC. This is a godsend for those times when your network just isn't playing ball.

Acer has filled this tiny box with some impressive hardware. Intel's Xeon E3-1260L CPU does all of the heavy lifting, which is basically a Sandy Bridge CPU tweaked for server duties. Support for ECC memory has been added, a must for serious servers, and it operates at a base frequency of 2.4GHz, boosting to 3.3GHz under load. This quad-core, Hyper-Threaded CPU has a total TDP of just 45W, which accounts for the whisper-quiet operation of the AC100. Graphics are handled by the Xeon's built-in Intel HD 2000 GPU. Our review sample shipped with a mere 2GB of DDR3 ECC RAM, but this can be upgraded to a maximum of 8GB.

Our sample also included twin 1GB Western Digital SATA 6Gbps drives, which appear to be Caviar Blue drives based on their model number of WD10EALX. These 7,200rpm drives come with 32MB of

cache, and are decent performers. In our test machine they were configured in RAID 1 mode, though it also supports software RAID 0, 5 and 10 modes. These drives filled two of the four hot-swappable bays hidden behind the lockable front door, and the locking mechanism was easy to use. Six USB 2.0 ports, one eSATA and a single PCI-E x8 slot deliver excellent connectivity options for extra devices, all powered by a 200W PSU.

Windows Small Business Server 2011 Essentials came pre-installed, perfect for office networks of 25 computers or less. Our benchmarks showed the AC100 to be quite the performer, leading the pack by a healthy margin in many of the file transfer tests. When it wasn't leading the pack it was a very close second, so overall we'd say this was the best of the four when it came to file transfer speeds. CPU performance was also excellent, albeit not quite up there with the Lenovo server, but it's got plenty of muscle for on-the-fly transcoding.

We've got to hand it to Acer for delivering a speedy server in a form factor that will easily fit on or under your IT guy's desk, even if you happen to be your IT guy. It's got plenty of grunt for even the most arduous media serving duties, and is also perfect for a small business with moderate server needs. It's probably overkill for a household with less than a full family, though.



FROM
\$400



HP ProLiant MicroServer G7 N40L

It doesn't get any cheaper than this.

@ www.hp.com.au

✓ Very competitive price, excellent read performance, whisper quiet.

✗ Low end CPU, no hardware RAID 5.

Starting at just \$399 it's hard to believe that HP can deliver a server at this price. It's interesting to note the difference in price between the cheapest version and our review sample; increasing the drive capacity to 1TB and doubling the system memory doesn't seem to justify the huge leap to \$929. However, closer examination reveals the more expensive model includes a three-year onsite warranty, versus the cheaper model's one-year offsite warranty.

Even at the high end, we have to wonder how HP has delivered such an affordable server. From the outside looking in, it hasn't scrimped on the form factor. It's only slightly larger than the tiny Acer AC100, and will easily fit on or under your desk. It's one of the few servers with room for an optical drive; if you choose to install one you'll even have a capable ripping box. Seven USB ports allow room for plenty of devices, and unlocking the front door reveals four removable hard drive bays. However, they're not hot swappable, so you'll need to endure a reboot if you're adding or removing storage. RAID 0 and 1 is supported; unfortunately there's no sign of hardware RAID 5 – although you can do this in software with most Windows Server OSs. Our review sample arrived with twin Enterprise 500GB Seagate Constellation ES drives, each spinning at 7,200rpm. There's also a single eSATA port for a speedy external drive, along with two spare PCI-E slots for internal device expansion.

The 150W power supply suggests some relatively tame hardware. The CPU is an AMD Turion II Neo N40L CPU running on an AMD RS785SE/SB80M chipset, paired with a healthy 4GB of DDR3 800MHz ECC memory. This dual-core CPU tops out at just 1.5GHz and, as our CPU benchmarks show, it's a long way behind the other servers in the roundup. Despite the OS being 64-bit ready, we couldn't get this box to successfully run our x264 HD Benchmark in 64-bit mode, yet it worked fine in 32-bit mode. As a result we'd take that benchmark result with a large grain of salt. Given the CPU's ho-hum performance, it's unlikely this box will handle a large number of simultaneous media streams; one or two should be fine though.

Our file transfer results were a surprisingly mixed bag. While writing to the server proved to be the slowest of the bunch, reading from the server pegged it as the second fastest machine, strangely inconsistent considering one is usually tied to the other. Through all of our tests the machine remained whisper quiet, perfect if you're going to be sitting next to it all day.

Despite the mixed test results, there's no question that this server offers exponentially more powerful performance and features than a similarly priced NAS device. We doubt you could even build a similarly spec'd server in such a small package, and as a result have to give this exceptionally affordable home server two thumbs up.



\$1,100

7
10

Lenovo ThinkServer TS130

This media transcoding workhorse lacks storage.

@ www.lenovo.com

✓ Excellent expansion options: powerful CPU, strong write performance.

✗ Only two 3.5in HD bays, just 500GB of storage.

Unlike the other servers in this roundup, Lenovo has gone for a slightly larger form factor with the TS130, inhabiting a microATX tower. This makes it a little too big to hide behind your monitor, but on the flipside the extra room allows for more connectivity options. While pricing starts at around \$800, our review sample checked in at \$1,260, putting it in the same league as the WD and Acer servers.

Thanks to the larger case, the TS130 provides far greater scope for expansion than the competition... unless you're talking hard drives. Alongside the dual PCI-E slots are two more legacy PCI slots, and it's the only server to arrive with a DVD-ROM in place. USB 3.0 is an optional upgrade (delivered courtesy of an add-in card), but the default model ships with eight external USB 2.0 ports. VGA and DisplayPort out are also included. The 280W power supply is the most powerful in our roundup, with ample energy to make the most of the various expansion slots. However, drive options are incredibly limited for such a large box, with just two 3.5in HDD bays. This is a very strange oversight, and hurts the overall score considerably. Our test unit also arrived with just two 250GB hard drives in RAID 1 mode, considerably less storage than the other servers and again weakening this server's merits.

Powering this server is another Intel Xeon, in this case the E3-1225 processor, which is slightly less powerful than the Xeon found in the



Acer. It's still a quad core chip, but the maximum Turbo frequency is 3.1GHz instead of the Acer's 3.3GHz. When combined with the integrated Intel HD Graphics, it's plenty powerful enough for media transcoding on the fly to multiple clients. Despite the slightly slower CPU, the ThinkServer took out the number one spot in our CPU benchmarks. Windows Server 2008 R2 comes pre-installed, suggesting that Lenovo sees this box living in an office environment, and the one-year warranty is standard for this price point. Like the AC100, Intel Active Management Technology 7.0 is included, allowing for a robust set of remote monitoring and configuration options.

On the downside, our file transfer tests left us unconvinced of the TS130's prowess at managing data transfers across the network. While the write tests were excellent, reading from the server to our test PC showed some very lacklustre speeds, possibly as a result of the hard drives used within.

While we love the ThinkServer's expansion capabilities, the lack of internal hard drives and bays is a troubling oversight. After all, the first thing most server owners will want to upgrade is the number of drives and with just 500GB of storage it's an upgrade that will come sooner rather than later in the TS130. Yet with just two bays, owners will need to replace the old drives entirely, which is a waste of old storage.



WD Sentinel DX4000 4TB

A win in storage space, but that's all.

@ www.wdc.com

✓ Huge amount of storage, easy drive upgrade options, handy LCD screen

✗ OS limits your software installs, mediocre performance.

As the most expensive server in our roundup, we had high expectations for WD's SOHO server offering. It's obvious that the bulk of the cost has gone into the storage, with a whopping 4TB of storage space – a country mile ahead of the competitors. However, as you'll see from our review, this emphasis on storage space has come at the cost of functionality, as there's not much else that the default DX4000 can do.

Like the Acer and HP, Western Digital has gone for a tiny cubic form factor, making this an easy box to hide. We appreciate the inclusion of a small LCD screen on the front, which shows what the server's doing (booting up, running backups and more) as well as its IP address. However, the lack of any kind of video out means you'll need to do all of your server administration remotely, which can be slightly more cumbersome when things go pear-shaped. Under the LCD screen resides the four hot-swappable drive bays, and we found the locking mechanism to be perfect. The door covering these bays isn't lockable, which might be a problem in less secure environments.

Our review sample arrived with two of these bays filled by WD RE4-GP 2TB hard drives running in RAID 1 mode, enterprise class products limited to a 5,400rpm speed. Upgrading to three or four drives automatically migrates the existing data over to RAID 5 mode, a nice touch that non-techies will love. Unfortunately the default

choice of OS is rather limiting. While Windows Storage Server 2008 R2 Essentials is fantastic for backing up a network of up to 25 clients, and the unit also functions as a DLNA server, it doesn't support most of the third-party media serving software available for other servers. If you want to install something like Air Video Server or Serviio, you'll be out of luck. For this reason we were unable to benchmark the CPU to test transcoding performance.

The inclusion of two Gigabit Ethernet ports will be a godsend for some, but the DX4000 lacks connectivity options on the whole. Just two USB 3.0 ports adorn the rear of the case, a huge step down from other servers in this category. As far as we can tell there's also no option to install internal components due to a lack of PCI/PCI-E slots.

With so much of the cost geared towards the huge amount of storage, it's no surprise to see a relatively average CPU powering the server. Intel's Atom D525 dual-core CPU chugs along at just 1.8GHz, suggesting performance in the realm of the much more affordable HP server. Our file copy benchmarks show that the WD server leads the HP in write performance, but lags behind in read performance.

If you're after a pure storage solution, the WD Sentinel DX4000 offers a vast amount of capacity compared to the competition. Unfortunately this comes at the cost of performance and flexibility, making this device suitable only for a very specific set of users. **APC**



Everyone reaches a point in their lives when they have to start taking responsibility for themselves. It's no longer alright to merrily stagger through life's alleyways, peeing freely up the drainpipe of fun. When it comes to your digital life things are different. Part of that is making sure all of your digital stuff is kept safe and sound, but along with that most dull of things is making it equally easy to access.

The home server is nothing new – you might be running one already – and it's something APC has been recommending for years – but it's time we started taking the idea seriously, and part of that is knowing how to build and configure one. This is a box that's going to be running 24/7, keeping all of your data, files, films, music, photos and more safe and sound, as well as making them easily accessible. That's besides providing any network capabilities or streaming servers you might like to add.

For this feature, we've based our server around HP's keenly priced little MicroServer N40L. (You'll find a review of this box on page 27 of this issue.) Of course, you can always build your own, and there's no reason not to. We've got tried and tested solutions for this option as well.

Creating the ultimate server is more than running a box of hard drives – it's about the software, how the hardware is configured, and how the box is connected and accessed. Everything from creating a suitable Gigabit LAN to setting up a near-bulletproof RAID for combined automatic backup and performance access.

Most importantly, it has to serve and work as invisibly as possible while using as little energy as it can. Thankfully, all of this and more is possible. Just read on to see how easy it is and discover the delights a home server is able to offer.

So what are we doing? We want a box that we can network to store all of our files, back up the many systems we're running, and run all our shared networked services, such as printers and remote media streaming. But the question that hangs over this project is: What's wrong with a good old-fashioned network-attached storage

box of tricks? The truth is, we like NAS boxes because they offer a simple, discrete way of adding network storage, often with extra services, with a minimum of hassle, outlay or power usage. With options running from single-drive models up to full quad-drive RAID boxes, they'll even take care of the whole boring issue of backing up your machines.

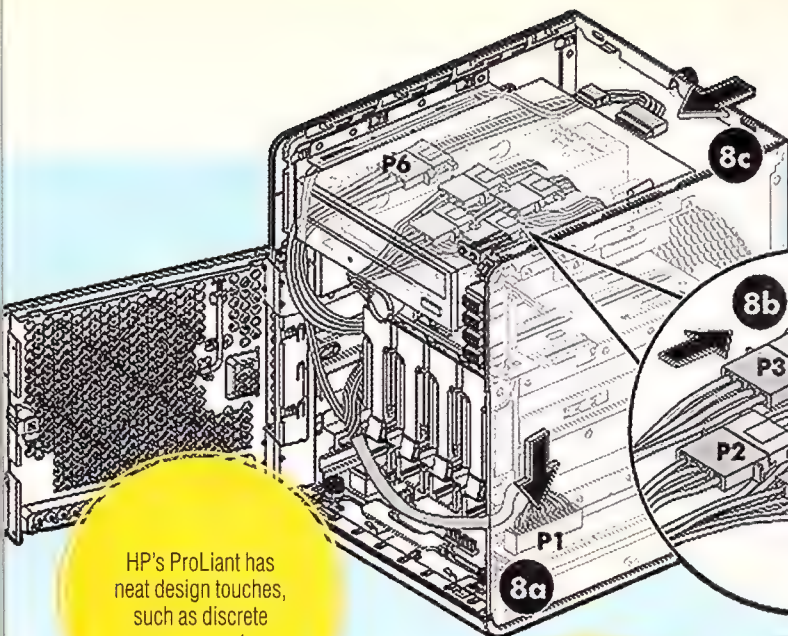
If you're willing to spend a little more (bearing in mind that a decent dual-bay NAS will set you back \$250, or closer to \$400 with a drive), you'll get a more flexible server system, including processor, memory, motherboard and a basic drive for \$300 that will happily run any and all software you want, providing remote desktop access and full Windows server features. It's these last two items that really swing it for us.

Having a home server means that even if new media formats or standards are released, the software can be easily updated, whereas a NAS would very likely not be. A server can also be upgraded, and offers full remote access both in terms of streaming services and a remote desktop. You don't have to bend to the whim of limited NAS services – with a home server you can choose to use FTP, Dropbox, iCloud or all of them together to create your own personal cloud.

DIY OPTIONS

There's no reason you can't put together your own server box; we're simply extolling the virtues of a dedicated box as the neatest option both aesthetically and technically. If you want to go your own way, a Shuttle-style barebones PC works well, but many only provide two drive slots – though often the optical bay can have at least one, if not two drives squeezed into it. If squeezing doesn't sound like your thing and space isn't an issue, packing a mid- or full-sized tower full of drives is another simple option.

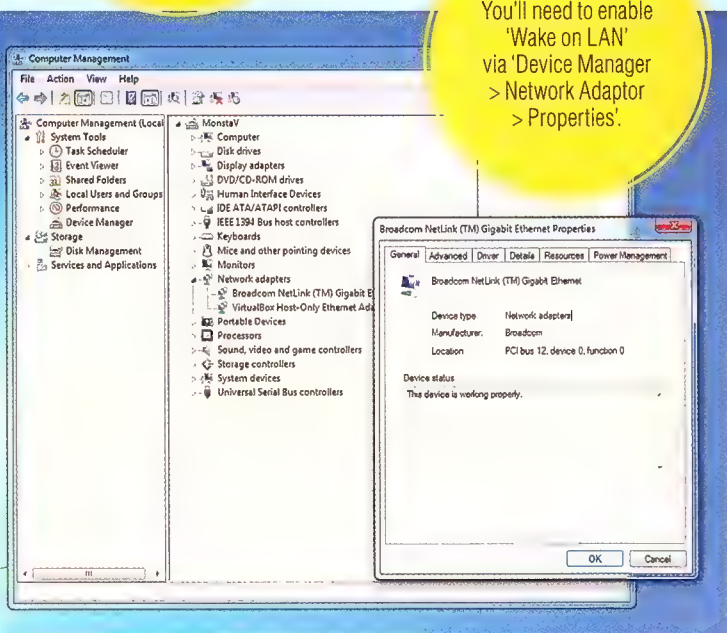
Talking of squeezing, draining every last drop of juice out of your server system is going to help beat the bills. Our favoured HP server doesn't do too bad a job, largely because it's based around a mobile AMD Turion architecture. When it's idling along, average



HP's ProLiant has neat design touches, such as discrete power connectors.



You'll need to enable 'Wake on LAN' via 'Device Manager > Network Adaptor > Properties'.



The real beauty of the HP ProLiant MicroServer is its design and build.

{ WINDOWS HOME SERVER 2011 MAKES SENSE; COPIES CAN BE SNAPPED UP ONLINE FOR \$60 }

power is around 30W, even with a full complement of five drives and two 2GB sticks of memory. Under load with drives spinning, it peaks at around 50W.

In comparison, NAS solutions will vary from 10W up to 50W or beyond. Before anyone starts screaming 'unfair', the lower 10W models are single drive units. Shifting to dual-drive solutions tends to see this rise towards the 20W mark, so they do represent the best low-power choice, but you'll be paying as much as the full HP option for what is, in our opinion, a slightly lesser solution. Our experience with barebones servers tends to involve them trundling along at 60W with a mid-range processor.

MORE MICROSOFT

We're like sad drunks in many ways – largely because we're sad drunks, but also because we keep going back to Microsoft for our operating system needs. But for once we're going to listen to our OS pusher. Choosing Windows Home Server 2011 (WHS) makes a lot of sense. It's actually the cheapest way of getting a legit Microsoft OS on a system; copies can be snapped up for under \$60 from many online retailers. It's secure, built upon Microsoft enterprise server technology, forces security protocols to keep files locked up safe and sound, and it's multi-system friendly, designed to interact and control networked systems for backups and definition updates.

Finally, it's right up to date with hardware support, including drivers and 64-bit.

Getting WHS up and running is a good deal faster than most other editions of Windows. The only stumbling block we encountered was caused by its increased security demands. These are based around a password of at least six characters, with mixed upper and lower case, at least one number and symbol. For some reason our keyboard was remapped after a reboot, which meant the symbol keys had changed. There's nothing like being kept on your toes.

Part of the magic of WHS is the Connector software. Once installed on your remote clients, it enables WHS to back up and monitor these machines. This is crucial for automatic and centralised backups, and helps monitor system health.

We can't stress enough how flexible the backup system is. It's able to back up new files on a daily basis, and restore entire systems, individual files or folders initiated from the client or server. Tied to this is health monitoring that can report the status of backups, free space levels and core services on Windows XP, Vista and 7 systems.

ARRAY FOR STORAGE!

As we've mentioned in the review section, one deficiency of the HP box is the lack of hardware RAID 5 support. This isn't as much



HP's MicroServer:
RAID 5 can be
run via the OS.

of a problem as it sounds because today, with lashings of processor power to spare, software-based RAID has become the favoured option. OS-controlled RAID also provides better error control and recovery should things go wrong. In fact, options like FreeNAS really require any hardware RAID to be turned off, or it can cause issues.

Within WHS, creating a software-based RAID – in fact a mirrored, spanned or striped array – is a very straightforward process. You'll only find RAID options in

Windows Server editions; desktop versions of Windows XP, Vista and 7 only offer spanned, striped and mirrored features due to licensing.

On your server, right-click 'My Computer' and choose 'Manage', then open 'Storage > Disk Management'. If you've attached new virgin drives, Windows will ask if you want them initialised. Confirm that you do, and they will show up unformatted. Right-click on one of the drives' detail sections to display the full gamut of drive options.

THE RUNNING MAN Greasing the wheels of computing.

We've been relying on Windows Home Server 2011 for this article. This is largely because it's how Microsoft sees the home networked ecosystem to function. For once, instead of fighting the beast, we're working with it. Frankly, it does make for an easy life – with all the remote automation and slick security tools Microsoft has developed, it works like a well-oiled machine.

Of course, there's absolutely no reason you can't get by without it. A plain install of Windows 7 will work just as well for many of your server requirements. If you have a spare licence for an older version of Windows 2000, XP or Vista, these will also work a treat, though security will start to slide a little as support diminishes.

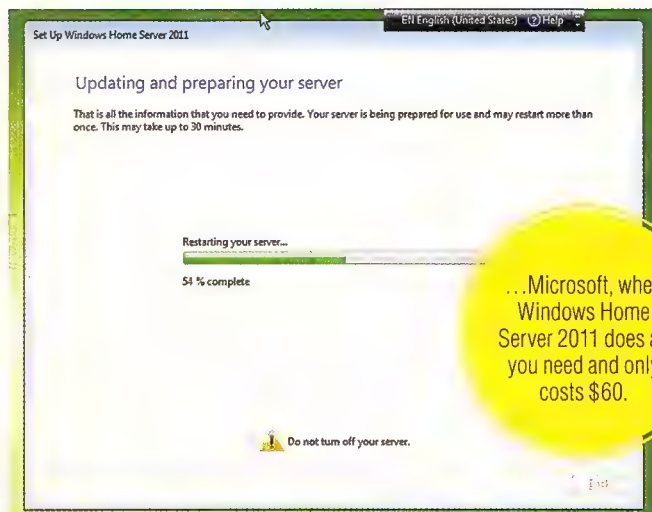
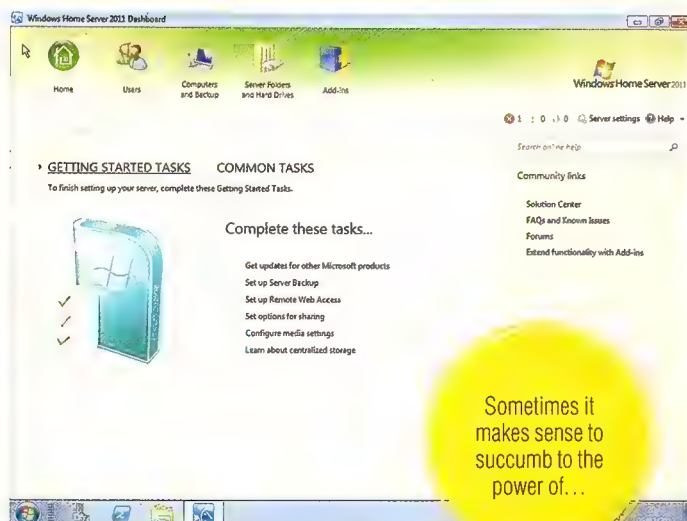
A more dedicated option is FreeNAS from www.freenas.org. As the name suggests, it's an operating system that's designed to run dedicated hardware as a NAS device. It's limited in certain ways, but it's built on the full BSD OS



and provides advanced features such as the Zettabyte file system, which offers a combination of advanced storage pools and logical storage management. We say it's limited, but there's still a host of streaming media and other features.

An obvious alternative is a Linux distro

like Ubuntu. While perfectly workable, this does mean you'll need to learn Linux to a certain degree. We've always found installation to be easy. Configuration of specific features can be awkward, but basic file sharing and even RAID configurations shouldn't be too head-scratchingly complex.



Choose 'New RAID-5 Volume'. A new dialogue box will enable you to add the remaining drives, and Windows will handle the rest.

After a short sync period you'll find a single drive with storage that approximates the total capacity of all the drives, minus 25% if you've used four drives to create the RAID. So if you use four 1TB drives you'll have roughly 3TB of storage, as 25% is used to store the recovery parity data.

A decent dual-drive NAS can be an OK alternative.

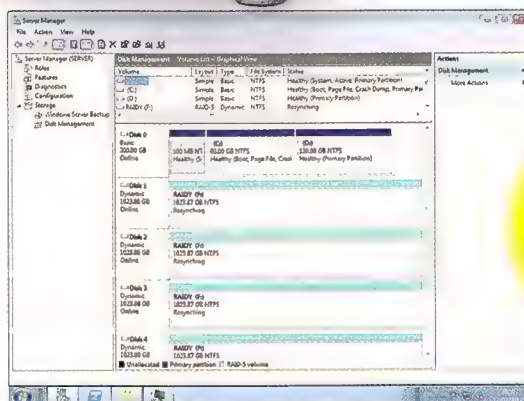
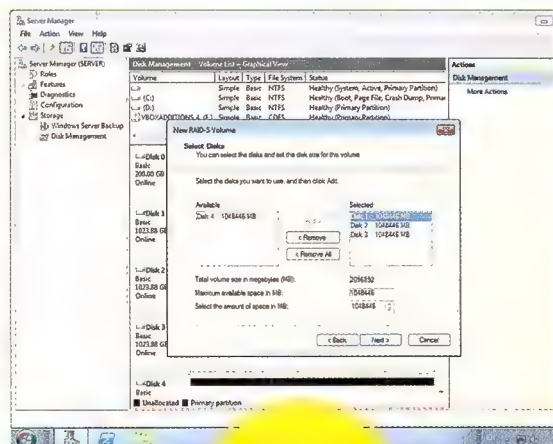


CROSS THE STREAMS

The latest edition of WHS 2011 provides some nifty media streaming features for both the internal home network, and when you're out and about over the internet. The streaming system is called Remote Streaming and is Silverlight based, but don't let that put you off. Support is reasonable and covers MP4, MOV, AAC, AVI, MPEG1/2/4, AC3, LPCM, MP3 and H.264. The system also supports transcoding, so it should handle most devices that need to connect to your network.

An important addition to these abilities is support for DLNA. This is a networked UPnP streaming standard supported by a wide range of home appliances, including many smart TVs, Blu-ray players and the Xbox 360. WHS provides flexible remote access to both shared files and media. This lets you stream media to a host of devices over the internet, not to mention provide secure access to files.

We wouldn't say WHS is perfect, but it's pretty good. Microsoft has even included a full 'add-in' system that enables third parties to extend its abilities even further.



Microsoft even has a convenient list of these at tinyurl.com/blqldft. One handy option is an advanced DNLA server from Serviio (tinyurl.com/7cuahlt). It's something we've looked at in a little more detail on page 36, and its transcoding and streaming skills come in very useful.

This is the start of running a solid home server. If you do any work at home,

it enables you to start securely storing, sharing and pushing files to the cloud. Beyond that, it's very handy to have a vast amount of high-speed central storage that can be accessed locally and remotely. Once it's set up, you're only going to use it more and more, and once you've had your bacon saved by a WHS backup (see page 40) you'll never go back. **BTG**

THE ZERO-COST HOME SERVER

Don't have enough cash for a new server? **Darren Yates** looks at your options for building a home server without spending a cent, including portable servers with UPS.

These days, there's almost an unwritten rule in most homes: you need at least one computer system for each person and one central system that everyone congregates around, whether it's for streaming music, swapping files or accessing the house printer. I call it the 'one each and one for the pot' rule.

But frankly, I reckon spending money on server hardware could be a waste given the number of PC and laptop carcasses most of us have lying around. That old computer might no longer be up to handling *Battlefield 3*, but you can give it a dignified retirement working as a home server. Do it right and you can build a server out of gear you already own – all without spending a cent.

HARDWARE OPTIONS – THE RETIRED DESKTOP PC

Thanks to Microsoft's procrastination in giving us Windows Vista, there are plenty of Windows XP desktops gathering dust that should be your first port of call. As for what you can get it to do as a server, that'll depend on two key factors – the processor and the storage options. For the CPU, we'll keep it simple – if you've only got a single-core CPU, like an old Pentium 4, it'll handle basic file and print

serving. Dual-core systems can ratchet this up a notch to live streaming and transcoding up to SD (DVD-resolution) video, and quad-core systems should be able to live-stream up to 1080p video.

Keeping this down to a budget of zero dollars puts the brakes on adding new gear, so you'll need to be a bit inventive and use whatever you have lying around. This is where USB is really handy. For example, if you have an old 80GB portable drive, whack it into a USB port and gain the extra space.

This isn't to say you can't use a Pentium 4 to send your 1080p videos across the network – but with limited CPU speed and possibly little storage, you need to be efficient. That's why you need to pre-encode your videos using H.264 compression and a two-pass encoding process. H.264 is about as efficient in terms of quality versus space as you'll get and a two-pass encoding system will ensure you get the best-quality encoding you can for the smallest amount of space. As a guide, you should be able to squish a two-hour DVD movie into 1.5GB of space with H.264, so that's around 160 movies on a 250GB hard drive. The other important benefit of H.264 and the MP4 file container is that they support 'progressive streaming', which means that instead of some players and tablets having to download the entire file before they begin to play the video, they'll start playing in a few seconds while the file downloads in the background. It's not the same as live streaming, where the video data is played and instantly discarded, but it requires far less horsepower.

HARDWARE OPTIONS – THE OLD NOTEBOOK

These days however, I'm much more up for using an old laptop as a server. We've had the benefit of cheap laptops for a few years now and most of us have one or two lying around. But with their smaller space requirements, lower power consumption and lower noise levels, they're well worth considering.

The other benefit, provided the notebook battery is still up and running, is that you've basically got a built-in uninterruptible power supply (UPS). Even if you only get 30 minutes out of the battery now, that should still be plenty to get the server to gracefully shut down and preserve your system, rather than have it fall over in a screaming heap.

The one difference, however, is that most serious servers running via a UPS also have a USB trigger that auto-initiates that graceful

Netbooks make great basic file servers.





power down – but laptops don't have it. So we've come up with a utility to fix this called 'APC ServerPowerTimer' (see the right box for details).

The downside is that laptops won't match desktops of a similar era for storage or CPU performance, especially going back a few years. Still, dual-core laptops have been selling for under \$500 for the last two or three years, so depending on what you've got, you should be able to at least do the print/file/torrent server option.

WHICH OS?

OPTION 1: USE THE ORIGINAL

Chances are your old desktop or laptop still has a working copy of Windows, which is likely to be Windows XP or, if you're really unlucky, Vista. But again, these OSs are more than enough to press into service for your zero-cost home server. Windows XP, even Home Edition, does the job here and provided you already have all device drivers installed, it's the simplest option. What I'd recommend is installing the OS from scratch, provided you have the original installation discs – this'll ensure you're starting with a clean slate.

OPTION 2: INSTALL A LINUX DISTRO

If you no longer have the original OS, Linux is my favourite replacement, having developed a couple of UserOS Home Server operating systems for our old sister publication *PC User*. The beauty of Linux here is you can choose your distro to suit your needs – everything from a lean server-focused distro such as FreeNAS (freenas.org) to a light GUI-based distro such as Xubuntu (xubuntu.org) – or go for the latest release of Linux Mint with the MATE (formerly GNOME 2) desktop environment (linuxmint.com).

The key thing is to go for a lightweight OS, which really means steering clear of GNOME 3 or KDE, or distros loaded up with OpenOffice. The more work your server has to do keeping the desktop environment ticking over (or the more irrelevant apps you load it up with) the less space and time it'll have to do what it's meant to.

NOTHING MAGICAL

In the end, there's nothing magical about a home server. In fact, they're often just ordinary computers being pressed into a different role. So if you've got a spare desktop or laptop lying around, don't waste it – get it working as a home server!

GET APC'S EXCLUSIVE SERVERPOWERTIMER

Most UPSs now come with a USB interface that triggers your server to automatically power down should the AC mains fail and the UPS kicks over to battery power. While Windows is great at warning you when your laptop battery is about to die, it's not so great at notifying you when the power source has changed.

A laptop is, in effect, the combination of a server with UPS capability – what it lacks is the automatic trigger to initiate a shutdown when the power source changes. It'd be a useful feature too, as there'd be little point keeping your home server running if there's no power elsewhere.

So we've come up with a simple utility called APC



ServerPowerTimer comes with a simple installer.

ServerPowerTimer (SPT) that does the job. It hooks in to the Windows API (application programming interface) and uses it to monitor the power source of your notebook. As soon as it switches from mains to battery, a timed warning is started, after which, a power down sequence is initiated and hibernates the notebook. If, however, the power comes back on during the timer countdown, it'll automatically switch off the timer and reset to monitoring.

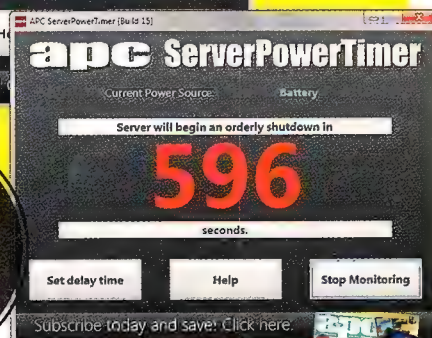
It runs on any version of Windows from XP Home Edition up, including 32- and 64-bit versions. Download it free from tinyurl.com/6pew3ew.

NOTE: APC ServerPowerTimer is copyrighted software and while it has been tested, it comes with no warranty so use it at your own risk. **apc**



It'll monitor your notebook's power source.

It initiates the countdown timer as soon as it detects battery power.



STREAMING YOUR MOVIES

Don't lock up your movie collection on your server's hard drive — watch it on your phone, tablet or TV. Darren Yates explains.

Right now, home entertainment is pretty much driven by the idea of media streaming — watching movies or playing music that originate from another drive on your wired or wireless network. But when you get down to practicalities, media streaming is a pretty confused area of computing that means different things to different people.

Let's say you use Windows Media Player (WMP) to play a .WMV file from a networked drive located on another computer — is that media streaming or just file serving? What about an app that transcodes a DVD ISO image into H.264/MP4 format on the fly and sends it to your iPad? Technically, they're both forms of media streaming, but it's pretty clear the terminology is about as vague as 'computer' is in describing a desktop PC and a Raspberry Pi. Bottom line, we need something more precise.

PASSIVE AND ACTIVE STREAMING

In the field of electronics, we talk about 'passive' and 'active' components, where active components (ICs, transistors) manipulate an electric current via a control signal, while passive components (capacitors, resistors) simply modify an existing current. I reckon it's a pretty good description of what's going on in media streaming too — 'passive streaming' is basically just file serving the original video file across a network, whereas active streaming involves some form of transcoding before the data is sent to the receiving device. It might sound nitpicky, but it's important to know the difference because depending on the device you want to stream your media to, you might need one or the other. For example, passive streaming is an easy choice when you have a playback device that can handle any audio/video codec under the sun. But throw an iPad into the mix (which effectively just handles H.264 video and AAC audio) and passive streaming doesn't cut it, especially if you have your DVD movies stored as MPEG-2-based ISO images or you're trying to play .FLV files.

WHERE TO GET THE APPS

iOS: Air Video Free, Emit Free and VLC Streamer Free are available on the Apple App Store. Air Video Server can be downloaded free from tinyurl.com/lcnnos.

Android: ES File Explorer, MoboPlayer and the ARMv7 codec pack are available on Google Play.

DLNA: Serviio can be downloaded from tinyurl.com/3982847.

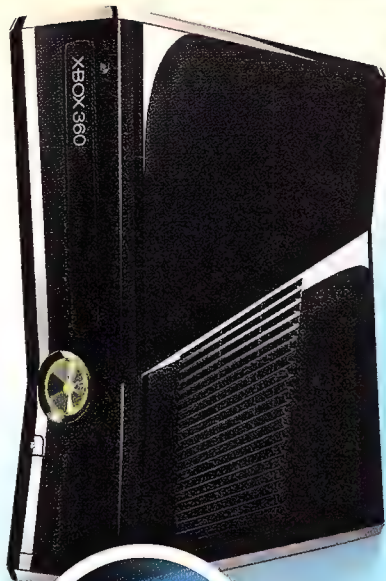


LIVE AND PROGRESSIVE STREAMING

Frankly, it's surprising that iOS offers so little in the way of out-of-the-box media streaming, because it actually comes with a brilliant Apple-designed technology called HTTP Live Streaming (HLS), which basically uses little more than HTTP to stream audio and video over a network. In fact, apps like Air Video, Emit and others rely on it. Briefly, HLS works a little bit like digital TV, using the MPEG-2 Transport Stream (MPEG-TS) file system and breaking the video up into small bite-size chunks. That makes it a definite example of 'active streaming'.

The problem with active streaming, though, is that you need plenty of CPU horsepower to transcode the video into the format, frame size and bit rate you need on the fly. Passive streaming requires far less horsepower, but you need to have the video in the right format to begin with. You'll also find some devices need to download the complete video file before they'll start playing it. If it's a two-hour/2GB movie, you could be in for a wait. But that's where a compromise option called 'progressive streaming' comes in and the MP4 file container supports it. In a nutshell, progressive streaming allows for almost-immediate playback while the video is being 'progressively' downloaded in the background. It's supported by iOS and Android devices, but you still have to have the space on the device to download the video and not all .MP4 files work unless they've been specially prepared.

To give you a better handle on all this, we'll look at three different options — active streaming to an iPad, passive streaming to an Android tablet and active streaming to a DLNA device.



STREAMING TO AN iOS DEVICE

Apple's iOS platform does a lot of things really well, but one area it doesn't rate is media streaming – and that's despite supporting HLS. But thankfully, there are a few apps now available that plug this gap.

Air Video is the most popular and it's a full active streaming app that will convert any video into the H.264/AAC video/audio format required by your iOS device. It also uses HLS

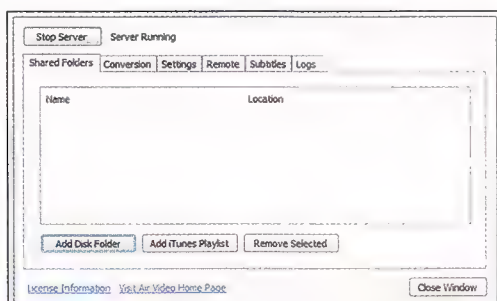
to get that data to your device. Emit is a similar option, as is VLC Streamer. The difference with VLC Streamer though is it uses VLC media player's network streaming capability and it also only supports passive streaming – that means you can only feed it H.264/MP4 videos. Emit and Air Video are active streamers – they'll take anything they can convert into iPad format.

What they all have in common is the way they work. You need to run a server app on the machine your videos are stored and the client app on the iPad. They're payware (around \$3 each) but each also has a free option. VLC Streamer is ad-supported but fully functional, while Air Video only plays a small number of files per folder – but it's worth spending the \$3 on the full version.

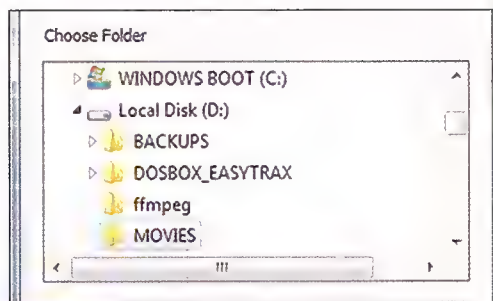
STREAM VIDEO TO AN IPAD

WATCH IPAD ON TV

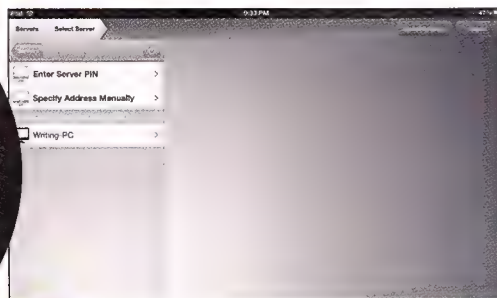
Grab hold of Apple's Digital AV Adapter cable and you get an HDMI output, plus a spare port for AC mains power. This will allow you to watch your video streams on your big-screen TV. You can grab it from Apple's web site or retail stores for \$45.



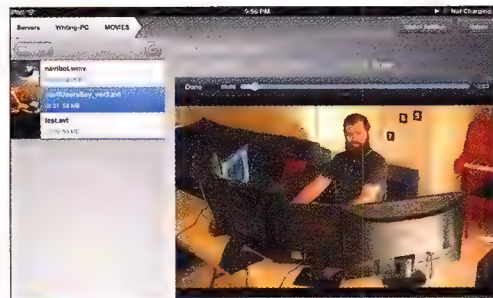
1 Install Air Video Free onto your iPad, install the Air Video Server onto your Windows XP/Vista/7/8 or Mac OS X system and launch the server.



2 Press the 'Add Disk Folder' button and select a shared folder (must be shared) on your 'server' where your movies are stored.



3 Start Air Video Free on your iPad. If you don't see your server, press the '+' and look in the menu under 'Computers on Local Network'. If not, make sure the server status says 'Server Running'.



4 Select the server inside Air Video Free. Choose a video. Hit 'Play with Live Conversion' to play immediately or 'Convert' to convert the video first (a better option for older PCs).



STREAMING TO AN ANDROID DEVICE

Like iOS, Android doesn't officially support a huge array of audio and video codecs – it's a little better than iOS, but not by much. However, where they differ is the supply of software codec packs. Video players such as MX Player and MoboPlayer are brilliant – not just because they're great players, but because they can play a huge array of video formats by simply installing a codec pack. The trick is knowing which pack to install – if you have an Nvidia Tegra-based tablet or any of the cheap tablets with a Cortex A-series CPU, you need to install the ARMv7 pack.

All Tegra-based tablets feature H.264 hardware acceleration, so they're capable of playing back at least 720p (1,280 x 720-pixel) video, even on a dual-core model.

Quad-core Tegra tablets can do 1080p (1,920 x 1,080 pixels). Those tablets using the Chinese-built Allwinner A10 ARM CPU also have hardware acceleration.

But when you talk about software video

decoding, you're relying now on the CPU to do the job and that's where things get tough – dual-core Tegra tablets will do DVD-resolution reasonably well, but single-core A10-based tablets and smartphones can struggle even with that.

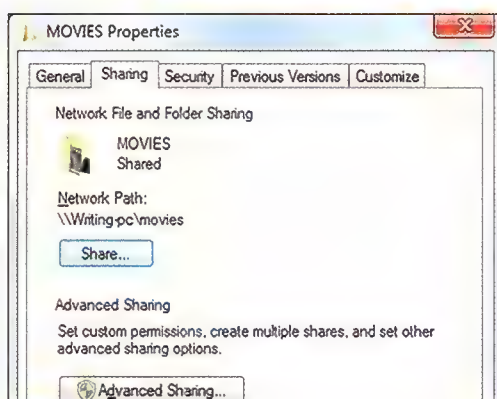
However, on the whole, the ability to use passive/progressive streaming makes this an easy option on Android devices. All you need is the combination of ES File Explorer and MoboPlayer on your Android, a shared folder of videos on your PC and you're away.

Both ES File Explorer and MoboPlayer are free, so there are no limitations to worry about and you'll find that any ads pushed onto the device aren't actually visible during video playback.

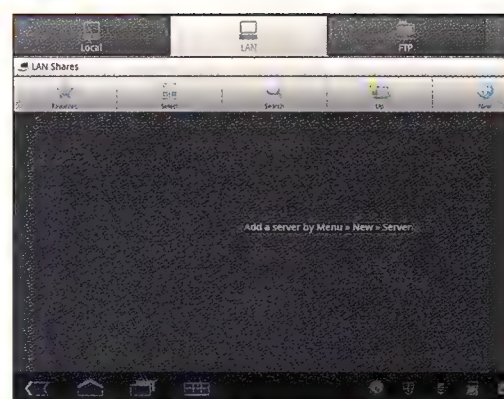
WATCHING ON TV

If your Android device has HDMI output, you can plug it into your big-screen TV and watch the show. Check your device for the type of output used – many tablets use the microHDMI connector and you can pick up a micro-to-standard HDMI cable from eBay for under \$5 shipped that works nicely (at least it does on Toshiba's AT1S0 we tested).

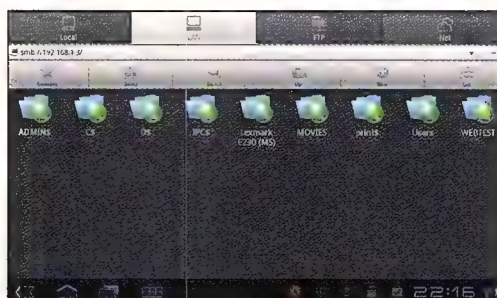
STREAM VIDEO TO AN ANDROID TABLET



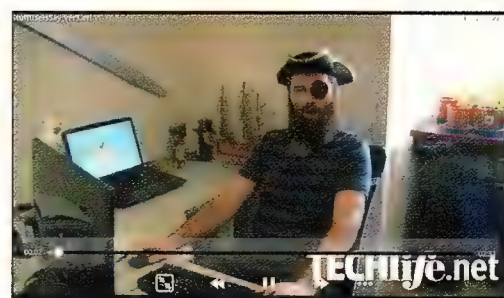
1 First, share a folder of videos on your server or PC. In Windows 7, right-click on the folder, choose 'Properties', click the 'Sharing' tab, click the 'Share' button, select 'Everyone' from the drop-down box, click the 'Add' button and press 'Share'.



2 Install ES File Explorer, MoboPlayer and the ARMv7 codec pack. Fire up ES File Explorer, select the 'LAN' tab, press the Menu button and choose 'New > Scan'. When you see your PC listed by its IP address, select it by tapping the IP address icon.



3 Select the shared folder with your movies, click on a movie and the movie player you want to play the file with. (You may be given more than one if you have multiple players installed on your device.)



4 The video should now begin playing. Adjust the aspect ratio if necessary to fit your screen.



STREAMING TO A DLNA DEVICE

DLNA stands for the fairly non-descript 'Digital Living Network Alliance' but it's a subset of UPnP (Universal Plug and Play), a group of protocols designed to enable compliant devices to locate each other over a network and share media without the user having to worry about passwords or network protocols.

Most so-called 'smart' TVs support DLNA, but even if you don't have a smart TV, you probably already have a DLNA-capable device you can plug in – PS3 and Xbox 360 games consoles are DLNA-compliant, as is the WD TV Live and many other network media players.

The trick with DLNA is that like iOS and Live Streaming, you need a DLNA/UPnP

server running somewhere on your network where your movies are located. Now there are a few options – Windows 7 actually supports DLNA streaming through its 'Play to' feature inside Windows Media Player 12. If you want a non-Microsoft free option, TVersity (free but feature-limited) is worth a shot but I prefer Serviio – it's totally free, runs on Windows, Mac OS X or Linux and has a wide device support list covering TVs, iPhones and the WD TV Live. It'll even handle active streaming with onboard transcoding.

While many smart TVs are basically ARM-based computers bolted onto big LCD panels, DLNA is simple enough to enable more consumer-focused devices like games consoles and compliant Blu-ray players

to give you networked media playback. However, in practice, it doesn't always work smoothly, especially if the server doesn't understand which codecs the playback device can cope with. That's why having a DLNA server that understands the playback device's capabilities makes all the difference.

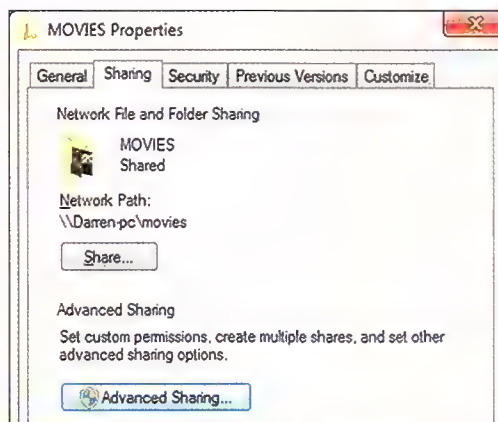


The four letters that make your PC video library happen on your Xbox 360 or PS3.

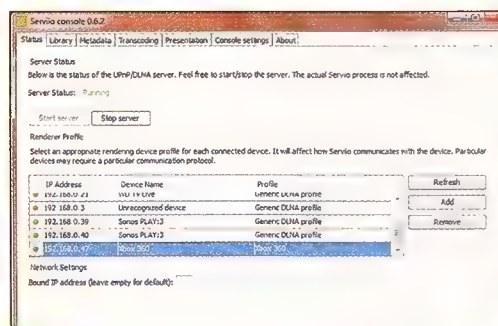
STREAM VIDEO TO AN XBOX 360

WHY DLNA IS GOOD TO HAVE

With DLNA, you can even extend the capabilities of network media players. Here's a quick example: Western Digital's WD TV Live doesn't support FLV videos but it is DLNA-compliant. By dumping your FLV clips into a folder shared with Serviio, your WD TV Live will play them through Serviio's live transcoding feature.



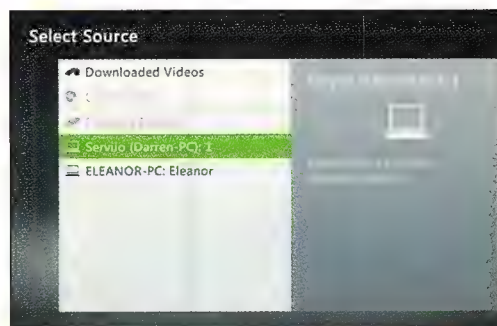
- 1 Download and install Serviio onto your network server, PC or notebook. Share a folder on your PC that contains your movies and/or music files.



- 3 Launch the Serviio Console. Make sure the render profile says 'Xbox 360'. Select 'Library' tab, press 'Add local' and choose the shared folder with your files. Check the five boxes at the end of the new entry line.



- 2 Fire up your Xbox 360 and hook it into your network (either Wi-Fi or Ethernet) via 'Settings > System > Network Settings'.



- 4 On your Xbox, navigate to 'Video > My Video Apps > Video Player'. Your PC and the Serviio server should appear in the 'Select Source' screen. Click on it and your shared videos should appear.

AUTOMATING BACKUPS WITH WINDOWS HOME SERVER

With auto backups on your new WHS setup, you'll never have to worry about losing files again! [Ashton Mills](#) explains how.

Naturally another great feature of a home server, especially if you've given it a bit of space, is as a central repository for your backups – and not just your desktop PC, but for every computer in the house. Windows Home Server makes it easy to not only back up all your computers, but automate it for you as well. Here's how.

(Note that we presume you've already installed Windows Home Server, followed the Getting Started Tasks including 'Set up Server Backup', and the server has plenty of disk space to store data from all the computers on your network.)

SETTING UP THE SERVER

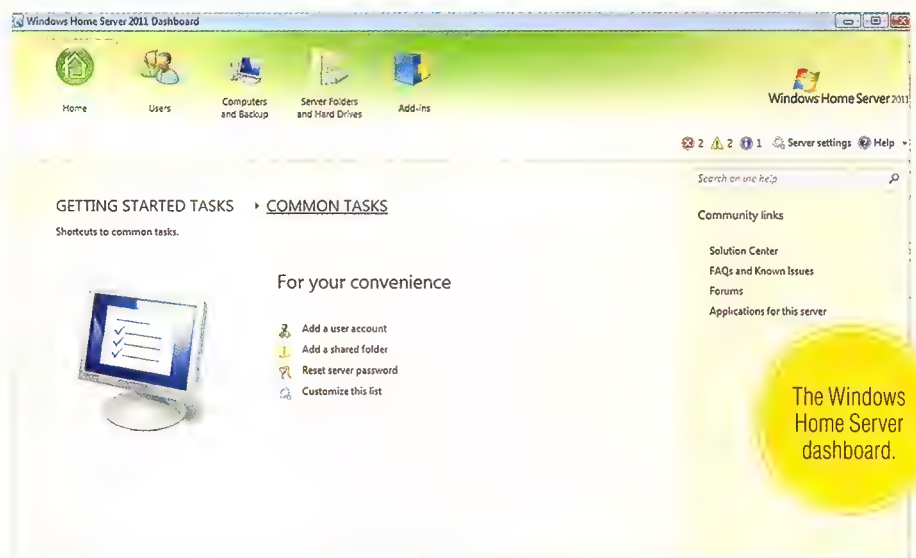
First, make sure any extra drives you've installed have been initialised. If you only have one hard drive in the server, feel free to skip to step 6 below.

1 Log in to the server, launch the Dashboard and Windows Home Server will notify you via an alert in the top right corner of the Dashboard if you have new hard drives to format or haven't formatted the spare drives already installed. Click on the alert.

2 Find any stating 'One or more unformatted disks...' and, in the description of the alert, you'll see a 'Tasks' heading. Underneath this click 'Format the hard disk'.

3 Now to put the drives to use. Click on 'Server Folders and Hard Drives' at the top, then select the Hard Drives tab.

There are two ways you can use extra

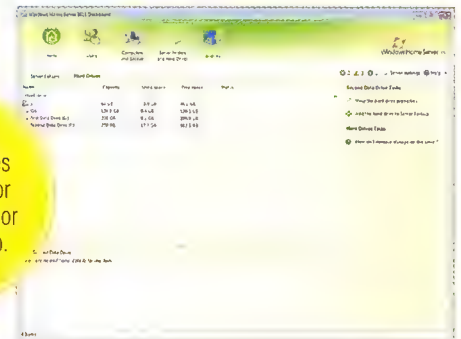


drives in your server: as storage for your files and folders (found under the 'Server Folders' tab), or to extend Windows Home Server's own backup. You should already have at least one drive set aside for backup as WHS requires it – although this can be an externally connected drive if you wish.

Extending WHS's backup is useful if you have a lot of data and the main backup drive's running low, but note that a drive allocated to server backup can't be used to store new data. To allocate a drive as a backup drive, simply right-click on it and select 'Add to Server Backup'.

Alternatively, if you have extra drives in the server beyond a backup drive, you can use this to extend your storage space. This is also, ideally, the best option when it comes to backing up data from PCs on your network – this way the storage drive is separate from the operating system drive in the server.

4 To set up a drive this way, you have to leave the Hard Drives tab and instead

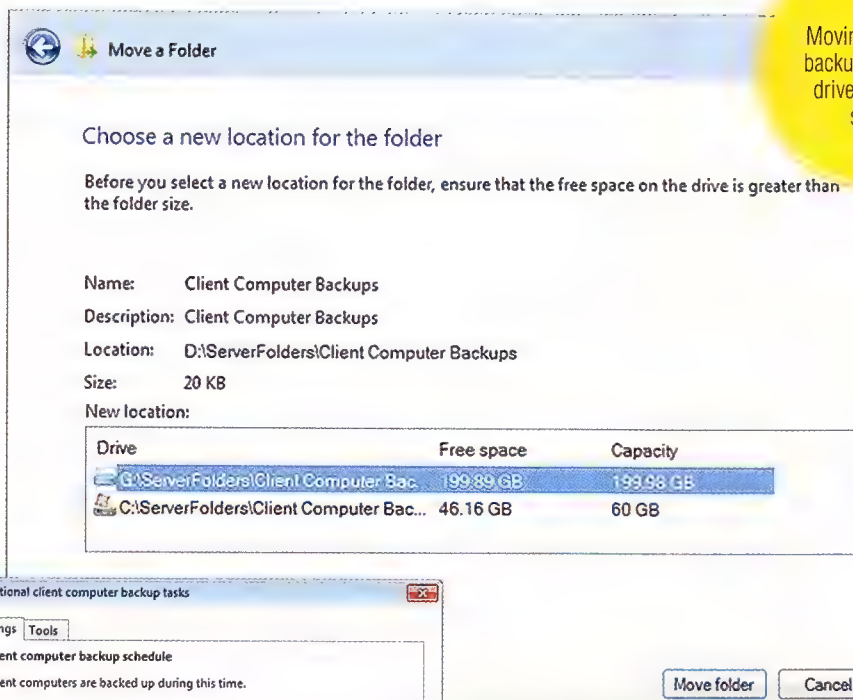


click on 'Server Folders'. The first folder is 'Client Computer Backups' and by default will be on Windows Home Server's main operating system drive.

5 To make use of your extra drive, we need to move the directory it points to. Simply right-click on the folder and choose 'Move the Folder', then select the extra drive when you're presented with options. If you already have data in the folder, this may take a while, as it's physically copied across to the new destination.

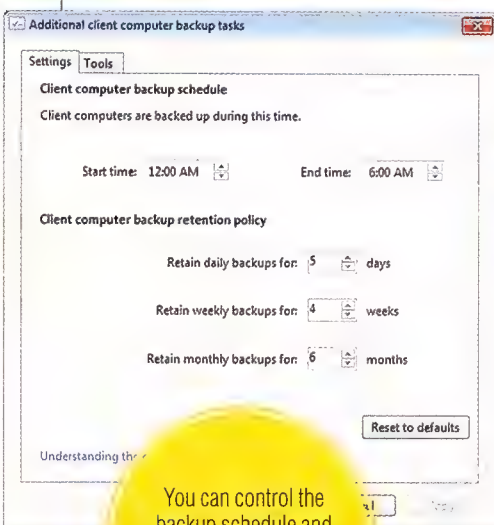
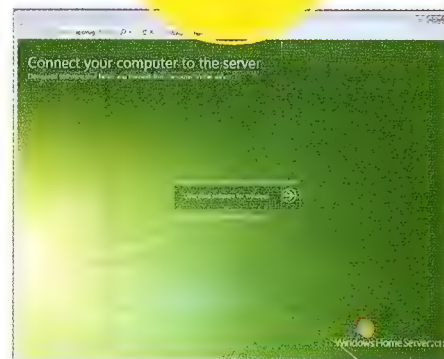
TRIGGERING A MANUAL BACKUP

By default, WHS will back up PCs based on a schedule, but if you want to initiate a backup without waiting – and you should certainly do this the first time a client PC is added to the server – click on the 'Computer and Backup' section, highlight the PC and, in the right-hand pane, click 'Start a backup for this computer'.



Moving the client backup folder to a drive with more space.

Installing the client connector software on Windows is dead simple.



You can control the backup schedule and retention settings from the 'Additional client backup tasks' box.

6 Finally, click on 'Computers and Backup' at the top and then, in the right-hand pane, click on 'Additional client backup tasks'.

This is where you specify when to back up, and how many backups to keep. Make sure you're happy both with the schedule and the retention policy, keeping in mind the more PCs you back up and the longer you keep the data, the more space you'll need.

And that's it for the server, now to set up the clients.

SETTING UP THE CLIENTS

Windows Home Server helps make setting up clients quite straightforward.

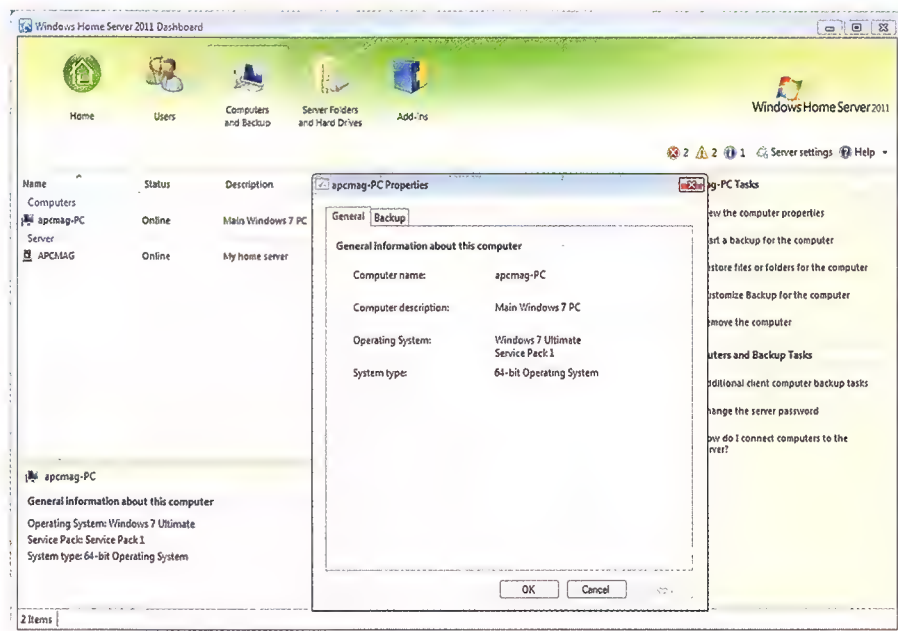
1 On each computer you want to back up, open a browser and type in `http://[server`

`name]/Connect` where 'server name' is, of course, the title you gave your server. Alternatively, if you know the IP address you can type that in and append '/Connect'.

2 A page will load, identifying you've connected to the server, with a button in the middle titled 'Download Software for Windows', as well as a link underneath to a Mac client for Macs. Download and install the software, which supports Windows XP, Vista and 7.

Note that the PC may need to reboot, and .NET will be installed if it's not already present. Importantly, make sure you have your server password handy!

3 You'll be asked if you want WHS to wake up your PC in order to meet the schedule and back it up, or, alternatively, to complete your backups only when the computer's on. That's a simple matter of preference but, as the dialogue notes, not all PCs can sleep and resume properly.



4 Once it finishes setting up, you can log in to the server directly from your client PC and access the Server Dashboard directly from this PC. It should come as no surprise that looking at the Dashboard under 'Computers and Backup' your client PC should now be present.

5 Now it's time to select which files and folders you want backed up. Click on the PC first and, in the right-hand pane, select 'Customize backup for this computer'. By default this is the whole PC, but you might not always want this — especially if doing so would involve a lot of space. Games can take up a lot, for example, and with services like Steam allowing you to re-download games, you don't necessarily need to back them up.

And that's it! As the Dashboard can be launched from the server or any of the client PCs, you can change the schedule and set what files and folders to back up from any PC on your network.

RESTORING FILES

While backups are initiated from the server, restoring any lost or corrupted files can only be started from a client PC.

1 Launch the Dashboard from a client PC and jump to the 'Computers and Backup' section.

2 Select the client PC and, on the right, select 'Restore files or folders...'. A list of available backups will be fetched from the server, followed by a breakdown of the folders and files in your selected backup.

3 Simply select what you want restored and WHS will do the rest.

RECOVERING FROM A CLIENT DISASTER

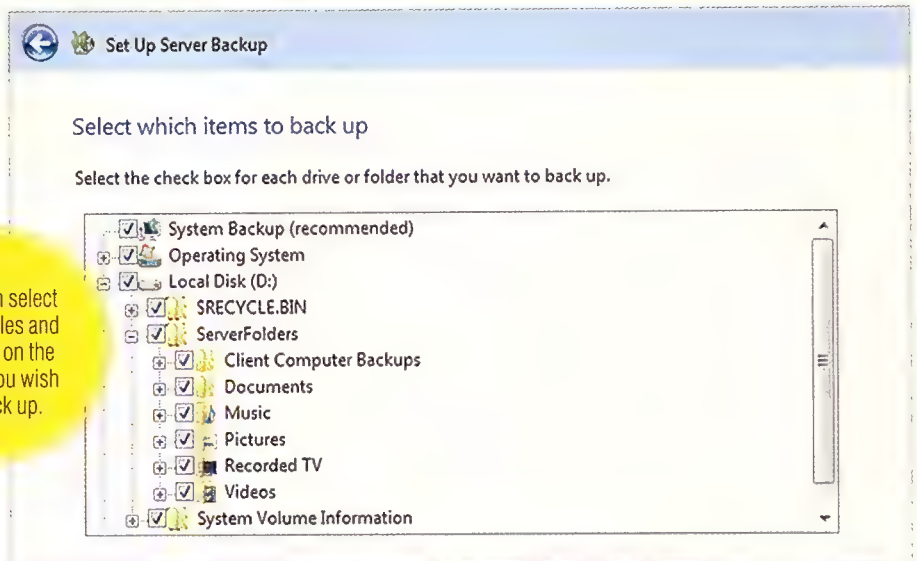
But what happens if you can't even boot a client PC to be able to launch the Dashboard? Windows Home Server has you covered here, too:

1 First, log in to the server directly and launch the Dashboard.

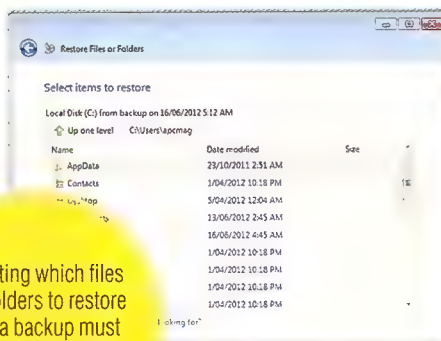
2 Click on 'Computers and Backups' and, in the right-hand pane, choose 'Additional client backup tasks'.

3 Under the Tools tab you'll find the 'Computer recovery' section. To get started, click 'Create key'.

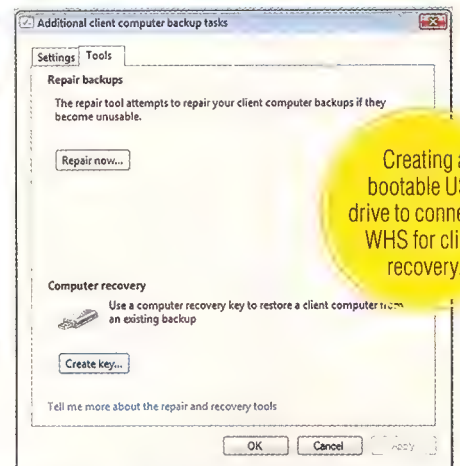
4 Make sure you have a USB key of 512MB or more, and click Next to create. This makes a bootable USB key that can connect to the server and start restoring a backup. Make sure the PC can boot from a USB key (you might need to enter the BIOS and change the boot order) and you're done. [BPC](#)



You can select which files and folders on the client you wish to back up.



Selecting which files and folders to restore from a backup must be done from the client PC.



Creating a bootable USB drive to connect to WHS for client recovery.

MAKING LIGHT WITH THE LAUNCHPAD

The WHS client software also includes a neat utility called Launchpad. You can use Launchpad to more easily access WHS features without launching the full-blown Dashboard and — more importantly — Launchpad is a tool that the users on your network can use without requiring administrator login for the server.

First make sure a user account is present on the server (click Users and then 'Add a user account') and then, under the Properties for the user, set what can be accessed via Launchpad under the 'Remote Web Access' tab.

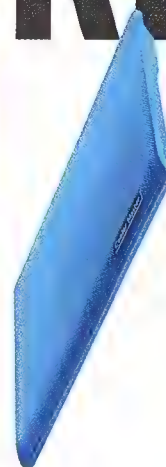
This can include shared folders on the server, media, remote web access, the Dashboard if you grant privileges and, of course, backup — so users can trigger a manual backup if necessary.

The Launchpad allows users to initiate backups by themselves.





ROCK YOUR COLOR WORLD



I100

slim type for ultrabook

Only 23mm ultra slim thick, I100 notebook cooling's ergonomic design provides comfortable viewing/typing angles, and is easy cable management.

Supports up to 15.4" laptops, Fan 140mm² x 1

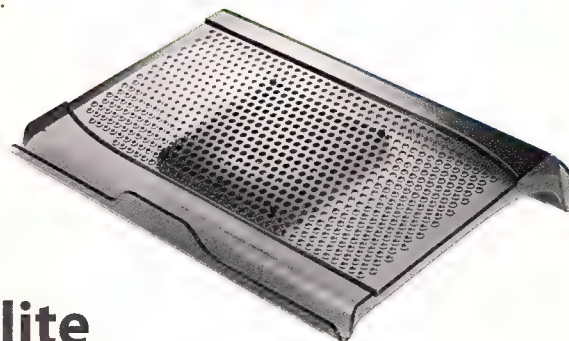
Dimensions 350 x 250 x 23~39mm



D-LITE

Has a simplistic squared design well suited for the home or office for up to 15" laptops. The lightweight design of this cooling pad also makes it easy to stow away.

Supports up to 15" laptops, Fan 140mm² x 1, Dimensions 346 x 269 x 53mm



U-lite

NotePal U-lite has a 100mm movable fan. You can place the fan on the hottest areas of your laptop to keep your laptop cool to the touch.

Supports up to 15" laptops, Fan 100mm² x 1, Dimensions 340 x 260 x 60mm



Cooler Master
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Netplus Micro Computers 08 9242 7288 netplus.com.au

CRANK UP YOUR SERVER

Want to get even more out of your server? **Nathan Taylor** looks at 10 apps that make your home server go above and beyond.

So you've set up some file and print sharing on your home server. Media services, too, to get your Xbox and PlayStation in on the act. But now you're looking to have your box do more.

Below, we've listed 10 apps that you should think about installing on your server as well. These include automatic downloaders, unique media services, a game server and even a full web OS.

And if that's not enough, check out our guide to using uTorrent remote on page 46 as well as our guide to setting up your server as a camera security hub on page 48.

Plex Media Server

www.plexapp.com

There are a number of solutions for streaming media to generic DLNA devices, but so very few that work well with mobile devices like phones and tablets. Plex Media Server is a rare exception. It's a media server with strong library features and it works very smoothly with the excellent Plex clients for PC, Mac, Android and iOS (the last two are available on the Google Play or Apple App Store for a small charge; the server and PC client is free). Plex shares a lot of DNA with the awesome XBMC. It was originally a Mac-based offshoot of that project, but evolved into a multi-platform project all of its own. If you want a turnkey solution for streaming your media collection to mobiles and PCs – and you're happy to use the Plex clients rather than a third-party solution – it's definitely worth downloading. Thanks to the myPlex service, it can also stream your media library to remote clients, including family members anywhere in the world.

IceCast

www.icecast.org

Icecast lets you effectively set up your own net radio channel, either for public or private consumption. It streams audio from your server to those who wish to listen – it can either be based on a live stream from your sound card or from a programmed MP3, AAC or OGG playlist. You can listen to a cast using Nullsoft's Winamp or through a variety of other SHOUTcast clients.

MLDonkey

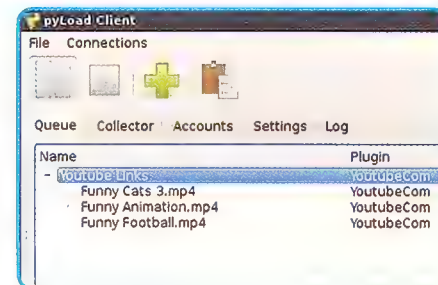
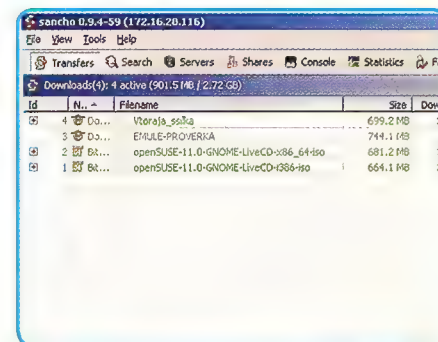
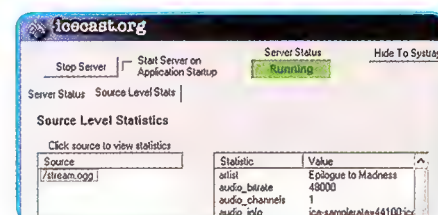
mldonkey.sourceforge.net

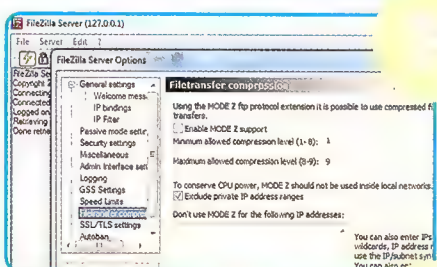
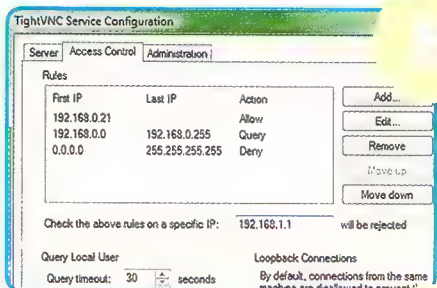
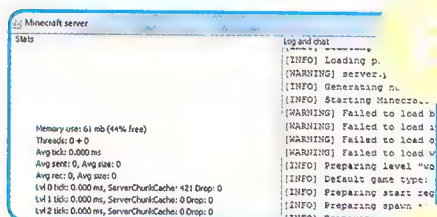
MLDonkey is a peer-to-peer network downloader with a twist: it operates in an entirely client-server mode. There are definite benefits to having a server-based peer-to-peer application, notably the ability to queue downloads from anywhere, even a mobile client, as well as preventing multiple P2P clients from flooding routers. As the name suggests, MLDonkey supports the eDonkey P2P network, but it also supports downloading from BitTorrent, FastTrack and even some more obscure networks like SoulSeek and DC++. It runs silently as a daemon or service on the server, while local apps can be installed on as many client devices as you like. These local apps control and queue downloads, but all the downloading happens on the server itself. There are MLDonkey interface apps available for just about every platform, with the notable exception of iOS; but even iOS users can access it using a web interface.

pyLoad

pyload.org

pyLoad is a download manager in the vein of JDownloader or FreeRapid: it queues and automates downloading from a variety of web services, including most of the major file hosts (sites like RapidShare or the now defunct Megaupload) as well as services like YouTube. It can also queue regular HTTP and FTP downloads. It supports CAPTCHA input – it will guess if it can, or ask the user if it can't – as well as premium accounts with file hosters. What sets pyLoad apart from the aforementioned JDownloader and FreeRapid is its client-server model. You can access pyLoad to add downloads or complete CAPTCHA queries through a web interface, and there's also an Android client you can download from Google Play.





We've cheated a little with this one and included two similar apps, both of which are handy for automating downloads from newsgroups and BitTorrent. CouchPotato and Sick Beard will monitor Usenet newsgroups and BitTorrent feeds for items matching the parameters you specify. When they find a match they'll download the file automatically. If you download episodic TV content, they're great for grabbing every episode that appears (and can also be set to download backlogs). Running them on your server means they can be always active and out of the way and will automatically put downloads in shared folders. They also have web interfaces for remote management on other PCs or any device with a web browser.

Sure, there are plenty of Minecraft multiplayer servers already running on the internet, but what if you want to make your own rules? Downloading and installing the Minecraft server lets you create your own world and limit who gets to play. Configuration can be a little involved, so you might need to check out www.minecraftwiki.net for a guide on editing configuration files.

Another specialised media streaming application, Subsonic is primarily designed for streaming music from your server to multiple PCs and mobile clients around the home. Unlike DLNA, it supports a complex library function and a direct web interface for playing music; there are also specific apps for iOS, Android and Windows Phone for playing music stored on your server. It can transcode tracks on the fly if your client doesn't support the native music formats, and it supports the SHOUTcast protocol for third-party clients like Winamp.

Installing a virtual network computing (VNC) server on your home server gives you the ability to remote control the server. VNC works in a very similar fashion to Microsoft's Remote Desktop: on your client device, whether it's a PC, Mac, tablet or whatever, you can see and control the server's interface. It's a very handy way to both remotely manage the server and effectively turn any device you might have into a fully capable terminal for that server. There are dozens of VNC servers available, but we're fans of the free TightVNC Server for Windows, which works with most standard VNC/RFB clients. You can also download the TightVNC Java client, which supports additional features like TightVNC's native multimedia compression.

An FTP server might seem a little anachronistic in the days of Dropbox, peer-to-peer and cloud drives, but FileZilla remains a very simple and effective way to share files across the internet without needing to get a third party involved. You just install FileZilla Server on your Windows server, then set directories and access controls. You can access the shares over the internet from any FTP client as long as you know the IP address of your server (or have dynamic DNS set up on your server or router). You can use the FileZilla client for accessing FTP shares, but most browsers will also support `ftp://` links to shared files.

The eyeOS developers describe it as a 'cloud operating system'; it's a complete suite of applications and tools that can be entirely accessed through a web browser. Install eyeOS on your Windows or Linux server and web clients can log in and use eyeOS remotely – it looks like a mini OS operating inside their web browser. It works with both PC web browsers and mobile browsers. You need to have a web server set up to install eyeOS, since it works primarily through PHP and XML, translating user actions back to the server to control the various apps. All users access a common file share (the server's) and can each have unique instances of apps running. There are 67 apps in the base package, including office apps, education apps, games, media players and mail and network apps. The free version of eyeOS can be found at tinivurl.com/7ecssne.

BITTORRENT FOR EVERYONE

Setting up uTorrent on your server solves a lot of problems and lets you trigger downloads from anywhere so they're ready when you need them, says **Nathan Taylor**.

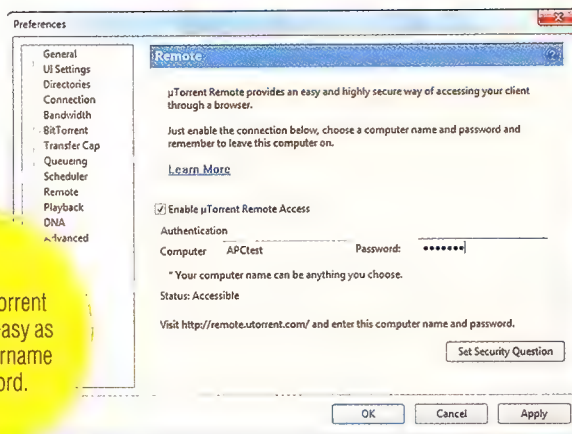
Using a server as a centralised peer-to-peer downloader has a number of advantages: it's (probably) always switched on; you can download files to a shared directory; it can be easily administered for bandwidth usage and you avoid having multiple peer-to-peer clients flooding your upload channel. That last one is especially important in homes with multiple P2P users, since running several P2P clients at once stands a good chance of flooding the router and making all internet activity painfully slow.

For those who wish to run it on a server, uTorrent (www.utorrent.com) has had a web interface for some time, but in version 3 of the BitTorrent client the developers have made it extremely easy to set up. You don't even have to worry about firewall negotiation and IP addresses/dynamic DNS for remote access – everything is managed through the uTorrent Remote web service.

uTorrent Remote lets you access your BitTorrent client from anywhere and any device just by visiting remote.utorrent.com in your web browser. This gives you fully functional remote control of your uTorrent installation. You can add new torrents, stop and start existing ones and even transfer downloaded files from the server to the device you're accessing it from.

To set up uTorrent Remote, just click on the remote control icon in the top right-

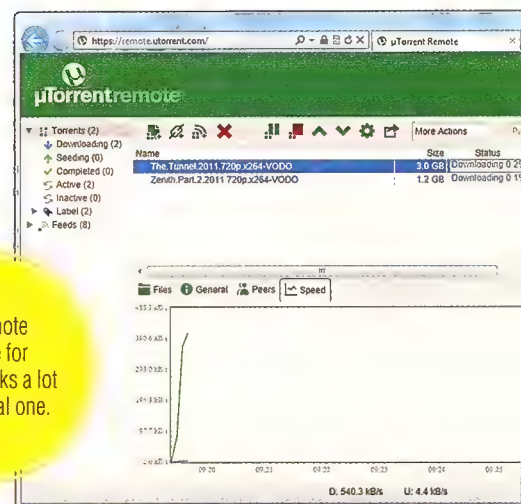
Setting up uTorrent Remote is as easy as entering a username and password.



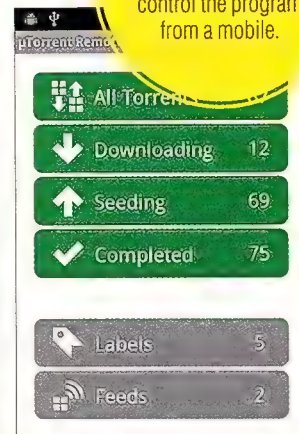
hand corner of the uTorrent window. This takes you to the Remote section of the preferences panel. Then just check the box to enable Remote and add a username and password. You'll be asked to answer a security question, and that's it. uTorrent gathers no private information.

Now head over to remote.utorrent.com and log in. You'll be shown a very similar interface to the standard uTorrent one, with a bar at the top where you can paste URL links to .torrent files, links to RSS feeds or you can upload a .torrent file from the machine you're using. Once you start a download, it will be controllable from either the web interface or the regular interface. **TOP**

The Remote interface for uTorrent looks a lot like the local one.



The Android uTorrent Remote app lets you control the program from a mobile.



USING FEEDS

If you want to make the most out of uTorrent Remote, you should add RSS feeds that support torrent-casting. Many BitTorrent web sites have them, including most of the major sites, such as The Pirate Bay, which has separate feeds for different types of torrents. Some sites even allow you to make your own custom feeds. Just look for the RSS symbol, right-click and copy the URL of the feed. Then go to uTorrent, click on Feeds in the left-hand panel, then on the 'Add feed' button at the top of the window and paste the URL of the RSS feed into it. Make sure

uTorrent isn't set to automatically download all torrents in the feed – if it is, you'll likely blow through your monthly quota very quickly!

The new feed will appear under the feeds section in both the web and desktop interfaces. Clicking on it will show all items in the feed, and double-clicking starts the download.

For users of the web interface this is invaluable – since it can't be set up as a file handler, adding new torrents in the web interface can be a chore. However, with feeds you can quickly add new items. If, for

example, you're at work and you'd like to have a download waiting for you when you get home, you can log on to the web interface, select a feed and double-click on the item.

Feeds are also really useful for the smartphone interface. There's an excellent uTorrent Remote app available at the Google Play store that lets you remote control uTorrent from your mobile. The app doesn't allow you to upload .torrent files, but it does allow you to add torrents from feeds – as well as stop, start and put downloads in a specific folder.

FREE HOSTING

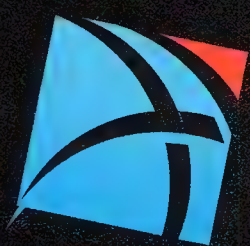
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BECOMING BIG BROTHER

You can turn your server or PC into a serious security hub by drawing video feeds from a variety of cameras, both local and remote. Nathan Taylor shows you how.

● Spy is one of those amazing open-source projects that far too few people know about. It's a free application that allows you to set and control an entire network of cameras and listening devices. From a PC, web browser or mobile device you can see or hear what the cameras or microphones are picking up. You can also have the cameras and mics record video and audio on a schedule or when motion is detected.

It works with both USB webcams and a variety of IP cameras, in high-def and low, and it can even access devices attached to other PCs. Dozens – even hundreds – of cameras can be managed from a single PC if it has the processing power to do so.

For home users, it has a variety of applications. The least nefarious include nanny cams for monitoring children and home security cameras. It can also be used for self-recording, covert monitoring and even time-lapse recording.

THE BASICS – ADDING CAMERAS

iSpy is easy to get up and running. Just go to www.ispyconnect.com and download and install the application.

After that, the first thing you have to do is add cameras or listening devices. Most likely you'll start with a local USB camera. You can have multiple USB cameras attached to a single PC.

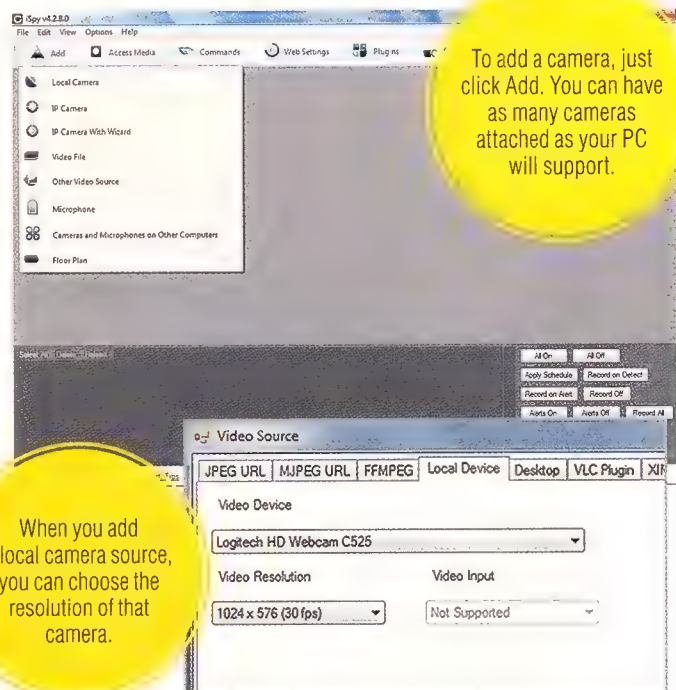
Click 'Add' in the top-left of the window. Then select 'Local Camera' from the drop-down list (if you have IP cameras instead, you can use the 'IP camera with wizard'). This takes you to the video source pop-up window, with the 'Local Device' tab preselected.

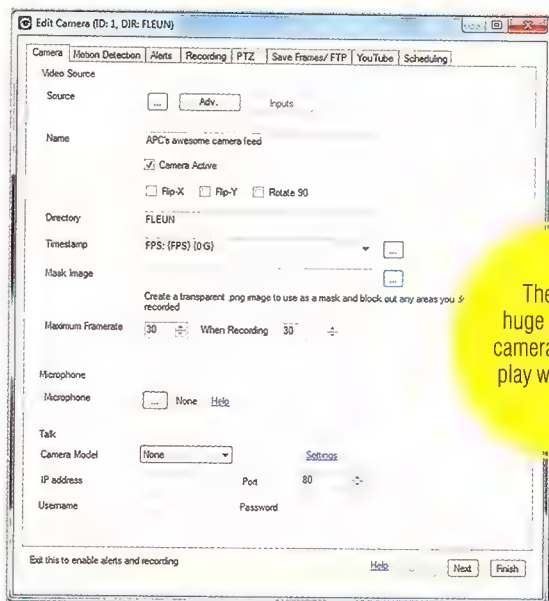
Note that from the 'Video Source' pop-up you can also choose other sources. Point it at a web URL if you want to add a video feed from an internet or IP camera source – MJPEG and Microsoft MMSH video streams are supported. You can point it to an online JPEG image for sites that use a constantly shifting JPEG image and you can even draw a feed from an Xbox Kinect device.

For now, however, we're assuming you have a local USB camera. In the 'Local Device' tab, select your camera. Then under 'Video Resolution', choose the resolution from the drop-down list. iSpy supports HD resolutions for those cameras that have them, but it might be a better option to choose a smaller resolution, since HD recordings can be massive, and multiple HD feeds tax the processing power of even the fastest computer. If you do choose HD resolution, it's wise to uncheck the 'No resize' box and enter dimensions in the 'Resize to' fields. This doesn't affect the camera recordings, but it will allow you to see the full image in the iSpy interface.

When you click OK, the 'Edit Camera' pop-up will appear. There are lots of options, though depending on the model of your camera some may not be supported. The key things to change include:

- Giving the camera a name in the 'Camera' tab. In the same tab, setting a maximum viewing and recording frame rate.
- Setting up motion detection thresholds (although you can use the defaults).
- Setting up recording in the 'Recording' tab; it defaults to 'Record





on Movement Detection', but you can change it to record never, always, on a schedule or time lapse.

- You can also set recording codecs and destination folders.
- Enabling alerts based on movement detection, which can be sounds or even emails and SMSs if you've subscribed to the web service (see below). Alerts can also trigger a script or app to run.

You can, of course, play with these settings at any time. For now, click 'Finish'. You'll see the camera feed in your main iSpy window (and there'll be a flashing red bar underneath it every time motion is detected). To change its settings just right-click on the feed. If you have multiple feeds set up now, you can drag them around the iSpy interface as you please.

SHARING WITH MOBILE AND THE WEB

If you're running iSpy from a server, you're probably not going to want to have to wander over to the server every time you want to see what's happening on camera. Fortunately, iSpy has a built-in web server so different devices can be used to check in on the feeds.

You can create a free account, which allows viewing only from within your local network. If you subscribe to iSpyConnect (for US\$8 per month), you can view feeds from anywhere in the world and from mobile devices. Subscribers can also get alerts delivered via SMS or email.

To set up the web server and access iSpyConnect, just click on the 'Web settings' button. You'll be asked to provide a username and password for the iSpyConnect account – or click on a link to create a new account.

Once you've done that, you can see all your camera feeds by going to www.ispyconnect.com in a web browser and logging in with your account details. By clicking 'Watch all', you can then select which cameras you'd like to view. Although you're accessing it through a web service, it streams video direct from your PC. iSpyConnect does not record or relay any video from the web service itself.

OTHER THINGS YOU CAN DO IN ISPY

We've only just scratched the surface of iSpy's capabilities here. If you really want to turn your iSpy server into a security and video hub, you can try the following:

- Setting up the PC's Windows desktop as a video source so the

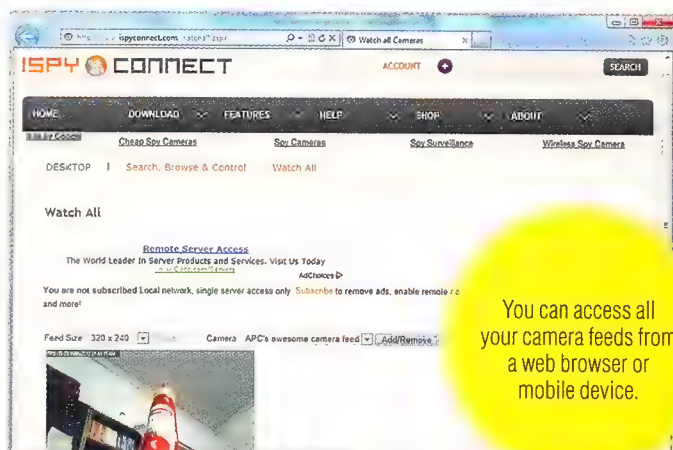
ISPY SERVER

With iSpy, you can actually add cameras attached to another computer to your network of devices. To do this, you need to install iSpy Server on that computer. This is a trimmed down version of iSpy that simply makes those cameras accessible to the central iSpy control device.

Once you've installed iSpy Server on the device you'd like to see the cameras of, go back to your main iSpy management PC and choose 'Add' then 'Cameras and Microphones on Other Computers'.

GETTING CAMERAS

iSpy supports both IP cameras and USB cameras (and can even draw on third-party camera feeds), but if you're looking to set up a home network of cameras, then IP cameras are your best bet. These will talk over your wireless or wired home network to your iSpy application, whereas extending USB cables around can be expensive and difficult. In addition, having multiple USB cameras from the same manufacturer can cause driver issues, as iSpy becomes confused about which camera is which. USB does have some advantages, however: the cameras are much cheaper and they can usually record higher definition video.



video stream you see is the actual desktop of the server. (This also gives a weird recursion effect when you view the video in the iSpy window – you're looking at the desktop image of you looking at the desktop. Somehow, however, the universe does not explode as a result of this paradox.)

- You can load up an image of your home's floor plan, tell iSpy where the cameras are located and use the floor plan to switch between cameras.
- You can set up pan, tilt and zoom controls on cameras that support it.
- With cameras that have reverse speakers (a feature of a number of IP cameras), you can use iSpy to talk to people through the camera.
- You can set up time-lapse photography, taking JPEG images at specific intervals.
- You can automatically upload recorded videos to an FTP server or to your YouTube account.
- iSpy supports plug-ins, including face recognition and number plate recognition (which can be used for triggering alerts), text overlay and video conversion from third-party feeds. [ATC](#)

SERIOUSLY BIG SHARED STORAGE

We'll admit that perhaps not everyone needs a fully fledged home server, but as our media libraries explode with digital content the demand for shared storage has never been greater. **Lindsay Handmer** tests 10 four-bay or bigger NAS boxes that can rapidly add storage to your network.

There's a growing trend for NAS devices to mimic small servers and run Windows or Linux. This is great if you need a server, but if you're just after a NAS product you still need to examine the specs carefully. Fortunately many NAS products are incorporating higher-end hardware such as Intel Atom CPUs and upgradeable memory. Almost all offerings now include USB 3.0 ports and can handle SATA 6Gbps HDDs. Some models are also starting to support 10Gbps Ethernet for upgrades.

Testing a NAS device can be a tricky business, so we take a two-pronged approach. First, with larger four-bay plus units like these, we set up each with four drives running in RAID 5. While you might not be using so many drives, this lets us really push the hardware and test its true capabilities. We connected the NAS devices to a dedicated Gigabit switch. Primary synthetic benchmarking was performed with Intel's excellent free NASPT tool. This tests reading and writing to the NAS as well as media serving capabilities. To test the real-world performance you'll get, we copied a variety of files directly with Windows Explorer. First we used a single 4GB ISO file to test sustained throughput. We then copied a custom 4GB folder with a collection of game files, images, zipped archives and media files of all sizes. This tests real-world file copying speeds, such as backing up data. Finally, we tested read and write speeds to a 16GB SanDisk flash drive. We also tested power consumption.

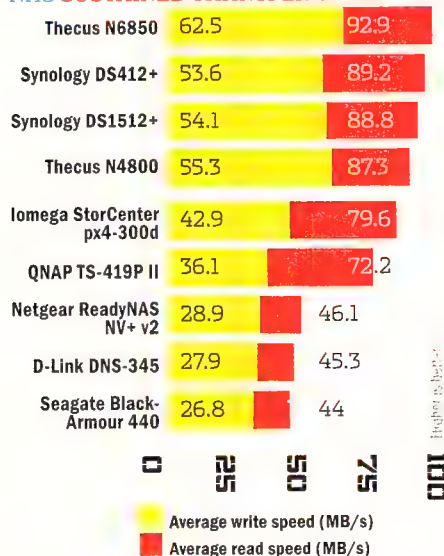
BUYER'S GUIDE

Choosing the right NAS can be tricky. First you need to decide if you want the drives included or if you're happy to install them yourself. Most NAS devices leave installing HDDs up to the user, but some make things simpler and are ready to go out of the box. To get useful speeds from your NAS, you'll need Gigabit Ethernet ports on all computers as well as your switch. If you plan on plugging in extra printers or external drives, make sure you check how many USB ports a NAS has. Most also include at least two USB 3.0 connections for faster speeds to attached drives. Some NAS devices can handle USB Wi-Fi dongles too. NAS devices don't use much power compared to a PC, but since they typically run 24/7, their power use can very quickly add up. On average, the NAS devices we tested used 46.6W at idle and 52.2W when in use. To put that in perspective, with 10% activity a NAS will add approximately \$90 to your yearly power bill.

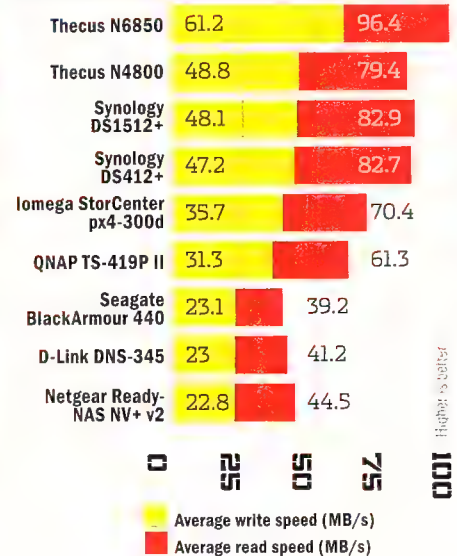
When setting up, your NAS RAID type is very important. Generally they default to RAID 5 if all bays are populated. This gives you almost full capacity and high speeds but with significant redundancy in case of drive failure. RAID 1 gives full redundancy but no speed improvement while RAID 0 gives zero redundancy but the best possible speed. The higher-end the CPU and the more RAM your NAS has means the faster it can process files, especially during transfers such as backups. But it also means more electricity used.

NAS BOXES: HOW THEY PERFORM

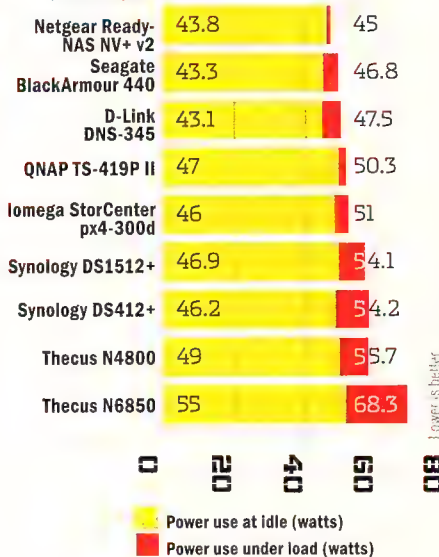
NAS SUSTAINED TRANSFER SPEED



NAS SIMULATED BACKUP PERFORMANCE



NAS POWER USE





4TB, 8TB, 12TB MODELS

TOOL-FREE HDD BAYS

STATUS LCD



7
10

\$1,650
(12TB)

Seagate BlackArmor 440

Not designed for medieval use.

@ www.seagate.com

✓ Includes HDDs, has media server functionality, includes backup software.

✗ Slowish transfer speeds, no USB 3.0, no diskless option.

The compact and shiny piano-black Seagate BlackArmor comes with four 3TB HDDs for total storage of 8TB in RAID 5. The drives are user replaceable without tools, so you can upgrade in the future if need be. Copying a single large file, we got average write and read speeds of 26.8MB/s and 44MB/s, while a directory of random files wrote at 23.1MB/s and read at 39.2MB/s.

You can use the included Seagate software to make setting up backups easy, but the NAS is also accessible directly through Windows. It has a built-in media server, making it easy to stream music and video to your devices. You can also access your files via the internet with Seagate Global Access. In use, the BlackArmor produced a mild hum and occasional HDD thunks – it was somewhat

like a quiet desktop PC.

The Seagate NAS has dual Gigabit Ethernet ports, which can be used to link multiple NAS devices together, but this only works with Seagate products. It also has four USB ports, which can handle external drives and printers or communicate with a UPS. No support is included for IP cameras and the LCD on the front can only display status information.

At idle the BlackArmor averaged 43.3W, while when in use it used 46.8W. It's also available online for under \$1,650 for the four-HDD model we tested, though you can't get it without any drives. The BlackArmor can happily handle small business use, but many home users will also appreciate the functionality it provides.

NAS SPECS

	CPU	RAM	Drive bays	Ethernet ports	USB ports	Drives included	Extra features
D-Link DNS-345	Marvell 1.6GHz	512MB DDR2	4	2	1	No	OLED Display
Iomega StorCenter px4-300d	Intel Atom 1.8GHz	2GB DDR3	4	2	3	Optional	USB 3.0
Netgear ReadyNAS NV+ v2	Marvell 1.6GHz	256MB DDR2	4	2	3	Optional	Handle, USB 3.0
QNAP TS-419P II	Marvell 2GHz	512MB DDR2	4	2	5	No	eSATA
Seagate BlackArmor 440	Marvell 1.6GHz	256MB DDR2	4	2	5	Yes	eSATA, USB 3.0
Synology DS1512+	Intel Atom 2.13GHz	1GB DDR3	5	2	5	No	LCD
Synology DS412+	Intel Atom 2.13 GHz	1GB DDR3	4	2	3	No	USB 3.0, 2x eSATA
Thecus N4800	Intel Atom 2.13GHz	2GB DDR3	4	2	4	No	eSATA, USB 3.0
Thecus N6850	Intel G620 2.6GHz	2GB DDR3	6	2	8	No	USB 3.0, eSATA

i

FIVE HDD BAYS

DUAL GIGABIT LAN

DUAL ESATA



\$900

7
10

Synology DS1512+

Is the extra cash worth it?

@ www.fortunetec.com.au

✓ Atom CPU, USB 3.0 ports, fast transfers.

✗ Finicky install, expensive, power hungry

With a collection of high-end features, the Synology DS1512+ is a NAS aimed at business or very demanding home users. It's not cheap, but it includes a host of extras you won't find elsewhere.

The Synology runs a dual-core Atom processor buzzing along at 2.13GHz. It has 1GB of RAM, but you can upgrade that to 3GB. It has five drive bays and can handle a total of 20GB of storage.

During setup, the Synology NAS was somewhat finicky, as we had to remove any partitions on the drives we were using before it would reformat them. Actually formatting the drives into our RAID 5 configuration was very quick and we were up and running in under 15 minutes.

Access speeds were very good and we clocked 54.1MB/s reading and 88.8MB/s writing with our sustained file transfer and read/writes of 82.9MB/s and 48.1MB/s with mixed files.

The DS1512+ can run its dual-Ethernet ports in linked mode so you can double your throughput. In the real world this feature will be rarely used as unless you're copying very large files, performance is generally limited by the CPU. You can add extra storage through add-in modules for a total of 60GB. The Synology system includes two USB 3.0 ports, four USB 2.0 ports and dual eSATA connections.

Power use was above average thanks to the CPU – averaging 54.1W under load and 46.9W at idle.

i

P2P SUPPORT

SMALL FOOTPRINT

ITUNES READY



\$500

7
10

D-Link ShareCenter DNS-345

Can the budget option compete?

@ www.dlink.com.au

✓ Cheap, includes media streaming, efficient.

✗ Noisy, slow setup, only a single USB port

Unlike some of the more expensive NAS devices available, the ShareCenter is aimed solidly at home users and very small businesses. You don't get all the bells and whistles, but you do get some solid features – the D-Link has a built-in media server for streaming audio or video and is compatible with iTunes and SqueezeCenter. You can also use the D-Link to handle your P2P downloads and it comes with software to automate backups.

It doesn't come with any HDDs of its own, but you can add up to four. The setup process is fairly straightforward, although we did have a few annoying niggles where the setup software couldn't find the NAS. It's also somewhat slow to format the drives, but we were using a very large 8GB RAID 5 setup. While not the fastest, it managed a reasonable 45.3MB/s read and 27.9MB/s write on our sustained throughput test. The mixed file test saw read and write speeds of 41.2MB/s and 23MB/s. It only has a single rear-mounted USB port, but it can connect to an external drive or printer.

The D-Link is smaller than many of its competitors and easily sits on a desk or shelf, though its thin shell lets a lot of HDD noise escape. The DNS-345 is fairly efficient and used 43.1W under load and 47.5W when idling. The D-Link NAS is a good buy for home users or small businesses who can find it for under \$400 with a little shopping around.



USB 3.0 FRONT PORTS

DUAL-CORE ATOM CPU

ESATA

\$950

7
10



Thecus N4800

Great for business and prosumer use.

@ www.altech.com.au

✓ Media output, UPS, fast transfers.

✗ Pricey, large, power hungry.

The Thecus N4800 takes a solid stab at the business market, yet at the same time it woos pro home users with features you just can't get anywhere else. Inside it has a third-generation Intel Atom D2700 CPU running at 2.13GHz and 2GB of DDR3 RAM. It's also got HDMI output, a mini UPS and USB 3.0 connectivity.

It has four bays so we filled them with our 3TB drives running in RAID 5. Setup is simple and fairly fast using the included Thecus software. As expected, data transfer was top-notch and we managed 87.3MB/s reading and 55.3MB/s writing in our sustained transfer test, as well as read/writes of 79.4MB/s and 48.8MB/s with the mixed file test. In use, the Thecus is very quiet, though not particularly efficient – using 49W at idle and 55.7W under load. The UPS option lets the NAS finish any data writes before shutting down, though it's not designed for extended running. You can also output video and play media files via HDMI or VGA – great for a spare TV or boardroom projector. The N4800 packs dual LAN sockets and four USB ports (two each of USB 3.0 and USB 2.0); the latter support external drives and printers plus eSATA. It has a small 2.8in OLED display that can be used to check basic readouts on the spot, though mostly you control the N4800 via the excellent web interface.

The Thecus N4800 will cost you at least \$800, but if you want a serious NAS device combined with a media player, it's totally worth it.



IP CAMERA SUPPORT

DUAL-CORE ATOM CPU

SSD SUPPORT

\$700

6
10



Iomega StorCenter px4-300d

Options enough for serious use.

@ www.iomega.com

✓ Fast, good software, multiple model options.

✗ Expensive, slow USB copy, noisy.

The StorCenter is designed for business use and won't really suit most home users. It's powered by a 1.8GHz Intel Atom CPU and has 2GB of RAM. The StorCenter has dual LAN ports plus two USB 2.0 connections that can handle IP cameras, external HDDs and printers. It also has a front-mounted USB 3.0 port for easy access.

Setup is as easy as plonking in your drives of choice and running the included software. It can be used to map your drives as well, making life that little bit easier. If you want to go for a solid-state option, it will support SSDs but doesn't include 2.5in drive bay brackets so you'll need to bring your own. Access speeds are excellent and we managed 70.4MB/s reads and 35.7MB/s writes on our mixed file test and read/writes of 79.6MB/s and 42.9 MB/s on our sustained throughput test. Copying from USB was very slow on the other hand – a measly 2MB/s – but was likely a network issue. The open front grille does help keep your drives cool, but also lets out a bit of noise. The Iomega's Atom processor is fairly efficient and uses 51W under load and 46W at idle.

Our Iomega came without HDDs, though you can buy iterations with up to 12TB of storage. While getting a NAS with drives included makes setup a little easier, you can typically save a bundle of cash by buying your own drives separately. If you need more HDD bays, there's also a six-drive model available.



DUAL USB 3.0

MARVEL 1.6GHZ CPU

DISK AND DISKLESS
VERSIONS



\$500



Netgear ReadyNAS NV+ v2

Now with updated firmware.

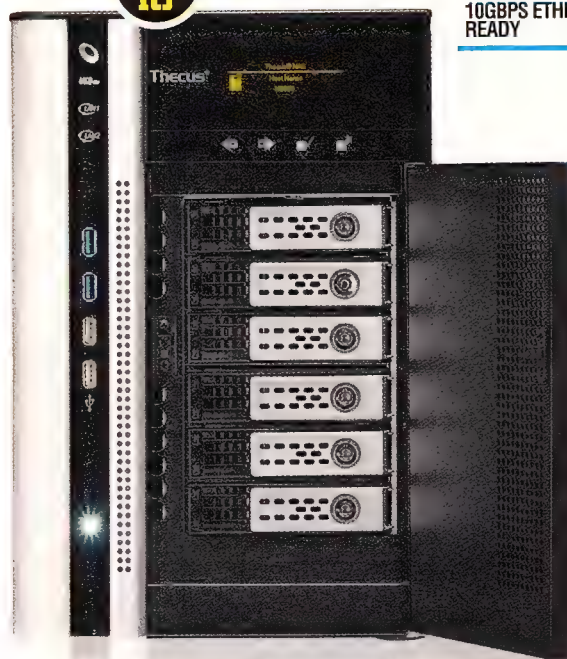
- @ www.netgear.com.au
- ✓ Affordable, efficient, quiet.
- ✗ Slightly slower than average, not much small RAM, slow CPU.

In an attempt to further corner the prosumer market for NAS devices, Netgear has released the ReadyNAS NV+ v2. Unlike more expensive options, the ReadyNAS is powered by a Marvell 1.6GHz CPU and has just 256MB of RAM.

When we got hold of this unit, Netgear had just released new firmware which we duly installed. Setting up the ReadyNAS was simple and quick and the web interface is slick and useable. When copying large files the Netgear managed a 46.1MB/s read and 28.9MB/s write. The slower CPU and small RAM slightly reduced its ability to handle a large number of random files, but with 44.5MB/s read and 22.8MB/s write speeds it still performed acceptably. The ReadyNAS was also one of the most efficient NAS devices we tested, using just 45W under load and 43.8W at idle. The small solid ReadyNAS is easy to store out of the way while also being surprisingly quiet. It includes a front-mounted USB port and instant backup button as well as a small LCD readout. There's also a sturdy carry handle round the back (these things can get surprisingly heavy with four drives in them), plus dual LAN jacks and two USB 3.0 ports.

The diskless version will set you back under \$500, though the ones with drives cost substantially more. In this case, some of the versions with included drives are actually quite good value versus buying your own, so shop around. The Netgear is great for your network or home office, but serious business users should look elsewhere.

\$1,700



Thecus N6850

Hungry for your files.

- @ www.altech.com.au
- ✓ Fast and powerful, built-in antivirus, six drive bays.
- ✗ Expensive, power hungry, large size.

The problem with NAS devices is that if you want a more powerful CPU and extra drive bays, you often have to start looking at small servers. Fortunately Thecus produces the N6850 – a very capable but still simple NAS.

Buried inside the chunky mini-tower body is an Intel G620 CPU running at 2.6GHz, backed up by 2GB of DDR3 RAM. It can handle six SATA 6Gbps drives in all the normal RAID configurations. You also get four USB 2.0 ports and four USB 3.0, plus HDMI output for media playback. You can plug in external HDDs, optical drives and printers. The N6850 also includes an inbuilt NAS version of McAfee AntiVirus. The dual LAN ports support 10Gbps Ethernet for future speed upgrades.

The Thecus leverages its powerful CPU with a custom NAS operating system for excellent transfer speeds. While the sustained read and write speeds of 92.9MB/s and 62.5MB/s respectively are nothing too over the top, it powered through our simulated backup test with a 96.4MB/s read and 61.2MB/s write. The downside is that, not surprisingly, the power draw is significantly higher at 68.3W under load and 55W at idle.

All this tasty hardware doesn't come cheap either, and you can expect to pay \$1,700 for the 6850 with no drives. While this is probably out of the price range of most home users, the Thecus is a decent business-focused NAS without the cost of a high-end server.

- i** ESATA SUPPORT
- USB BUTTON BACKUP
- SUPPORTS USB PRINTERS

\$650

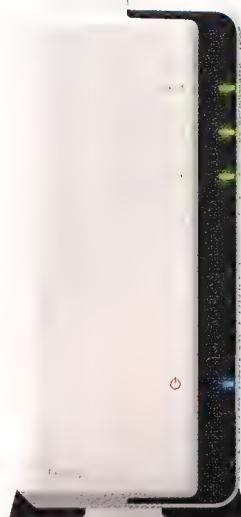
**E
10**



- i** USB 3.0 AND ESATA
- USB SPEAKER SUPPORT
- INTEL ATOM 2.13GHZ CPU

\$700

**E
10**



QNAP TS-419P II

An affordable NAS with strong specs.

- @ www.qnap.com
- ✓ Five USB ports, affordable, fast.
- ✗ Niggly setup, no USB 3.0, rattly.

Synology DS412+

A basic feature set backed by a powerful CPU.

- @ www.fortunetec.com.au
- ✓ Relatively cheap, fast, simple to use.
- ✗ No LCD, somewhat noisy, no security locks.

The TS-419P II is aimed at small business or home users and has a lot of media-player-centric functions. It doesn't ship with any drives, though it can handle four drives for a total storage size of 12GB. For testing, we used four 3TB drives running in RAID 5 for a total storage of 8GB.

Setting up the QNAP should be as easy as plugging in the drives, installing the software and booting it up, but in practice we had a few issues. As an example, we had to download the latest firmware, as the one on the included CD wouldn't work, and we also had to do a full factory reset on the unit after setup, as it wouldn't accept the initial password we selected.

In use, the QNAP is quite fast and we recorded a sustained write speed of 36.1MB/s and a read of 72.2MB/s for our sustained throughput test. This drops off a little to read/writes of 61.3MB/s and 31.3MB/s respectively when copying lots of randomly sized files, but it is nonetheless very usable. While generally quiet, we found the HDD trays in the QNAP to be a little rattly when all drives were being accessed.

Round the back you get dual Gigabit LAN ports as well as five USB ports. The one on the front lets you back up a USB flash drive with one button push. With a loaded power draw of 50.3W it's not the most efficient model, but considering you can buy it for under \$600 online it's not a bad deal.

The problem with lower-cost NAS devices is that they often use slightly less powerful CPUs and minimal RAM. The Synology DS412+ takes a different approach and uses a powerful Intel Atom CPU running at 2.13GHz while ditching some other unneeded extras. It still has 1GB of RAM (upgradable to 3GB) but no LCD readout, only three USB ports (two USB 3.0) and has a basic non-lockable front cover. You do still get dual LAN ports that can operate in link aggregation mode to speed up transfers, an eSATA connection and wireless dongle and printer support on the USB drives.

No drives are included in the box, but the Synology Assistant program makes setting up the DS412+ very simple. With our 8TB RAID 5 array we managed to get read and write speeds of 89.2MB/s and 53.6MB/s on our large file throughput test. When copying our backup directory, we saw decent read speeds of 82.7MB/s and writes of 47.2MB/s. The DS412+'s chassis doesn't contain much of the drive noise, so you won't want to install it right next to your desk.

The DS412+ can be used to automatically back up your files, serve multimedia or let you access data on your phone. You can also plug in a set of USB speakers and use the NAS as an audio system controlled by a smartphone app.

The DS412+ uses an average amount of power – 46.2W at idle and 54.2W under load. It's very hard to find online for less than the RRP of \$695, so make sure you shop around.



7
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Acer Aspire Timeline Ultra M3

The shape of things to come?

www.acer.com.au @
\$1,400 \$

Good battery life, powerful and portable, good input devices. ✓

Terrible screen, gets hot. ✗

The Acer 15.6in Aspire Timeline Ultra M3-581TG-72634G52Mnkk promises ultrabook portability and responsiveness with the raw power needed for tasks like intensive gaming. But while it's a success overall, there are some issues.

On paper, the M3 is definitely an ultrabook – and it physically feels like one. At 2.1kg and 20.7mm thick, it's more portable than any all-rounder and has a low-voltage second-gen Intel Core i7-2637M, an Nvidia GeForce GT 640M graphics card, 4GB of DDR3-1066 RAM and a 500GB (5,400rpm) HDD with a 20GB SSD for caching. This got a strong 2,818 in PCMark 7, which roughly matches all-rounders like the Sony VAIO E Series 14P. In testing, it booted in 31 seconds.

Ultrabooks need good battery life and the M3 does deliver here. Switching off Wi-Fi and Bluetooth, setting it to Balanced and running Powermark on the Productivity preset gave a result just shy of six hours; slightly better than the strong showing of the 13.3in Samsung Series 5 Ultra 530U3B we reviewed last month.

Nvidia claims that the M3 can run the demanding *Battlefield 3* at Ultra settings, though that didn't pan out in our testing. While not a slideshow, to get consistently smooth performance in busy maps we had to drop the settings down to High. This performance, in all fairness, was still terrific.

We should note, however, that during intensive gaming the M3 got *hot*. While gaming, the CPU stayed at about 90°C. Blocking an underside vent (say, when you use the M3 on your lap) caused the CPU temperature to climb above 90°C which induced on-and-off throttling down to about 800MHz.

The M3's build quality isn't quite as good as ultrabooks like the ASUS Zenbook, but the plastic chassis was still decent and the metal screen backing was nice. The enormous touchpad was sensitive, accurate and rejected palm presses. We liked the keyboard, even if alternatives like the HP Folio 13 have a better one. The speakers were pleasantly loud, although they weren't as sharp as those in laptops like the HP Pavilion dm4-3011tx. Unfortunately

the webcam's recording quality at 1,280 x 720 pixels was poor. The M3's physical connectivity was respectable, but not as good as some smaller ultrabooks (Toshiba's Satellite Z830 a prime example). It had HDMI, USB 3.0, two USB 2.0 ports, Gigabit Ethernet, an audio jack and an SD card reader. Given the size, we expected more. Sadly the M3 had a woeful screen. The 1,366 x 768 resolution was fine, but it had awful contrast, weak viewing angles and washed-out colours – it's not particularly great for either gaming or movies.

Still, if the M3 is the shape of all-rounders in future, there's a lot to like. It's far more portable than most other all-rounders and while the low-voltage CPU isn't as powerful as an equivalent full-voltage chip, PCMark 7 shows that the M3's overall performance was still impressive. The heat was worrying and the screen was disappointing, but the M3 does successfully show that you can have all-rounder performance without the weight.

Conrad Bem

9
10

ASUS Transformer Pad TF300T

Half tablet, half netbook, total win.

www.asus.com.au @
\$599 \$

Converts to a netbook. ✓
Won't quite replace your laptop. ✗



A keyboard-equipped tablet draws comparisons to the device it most closely emulates: the laptop, but scrap any thought that the TF300T could replace your primary PC – Android isn't yet a replacement for a traditional desktop OS.

The Transformer series should be viewed as an evolution of the netbook. At \$599, it sits at the top tier of netbook prices, so don't lose sight of the fact that it also does all those things that only a tablet form factor allows (curling up in bed with a digital magazine, for instance).

As a tablet, we love this device. The keyboard not only extends the battery life to 12 hours, it provides a full-sized SD card slot and USB port – handy if you use it as a media device on your TV and you want to



The keyboard provides a tablet stand and protects the screen in your bag.

load the latest creative commons Full HD feature film. Function keys – multimedia, wireless, Android Back and Home – is a blessing I never knew I wanted. Even the touchpad is welcome at times, if only because

muscle memory makes me reach for it. As a tablet, this feels solid, looks good and performs flawlessly. Once you add in a keyboard, it becomes truly lovable.

Simon Chester

7
10

Acer Iconia Tab A510

A capable, if forgettable, tablet.

www.acer.com.au @
\$549 \$

Blazing-fast processor. ✓
Lacklustre design. ✗

The Tegra 3 platform that Acer's latest Android tablet is based on is stellar, with blazing-fast performance and excellent battery life. The Iconia Tab A510, with its 32GB storage and Android 4.0 (Ice Cream Sandwich) OS, is one of the most capable tablets available. On paper, it's as impressive as it can be at this price, ignoring the lack of a 3G modem. Only, it hasn't tried to do anything more than look good on paper. The cheap, almost hollow-feeling plastic back is a testament to this.

We're glad Acer hasn't tried to differentiate itself by creating a new launcher (à la Samsung's revolting TouchWiz), but perhaps the best way to stand out from the competitors is through industrial design. The sole hardware choice that made us smile – a screen orientation lock switch –

is nice to have, but not enough to compete in a crowded market.

The small software changes Acer has introduced, however, are useful. The unlock screen has the familiar Honeycomb/Ice Cream Sandwich slide-to-unlock circle, only now you can also slide to open four chosen

apps. Additionally, there's a green button (the 'Acer Ring') in the menu bar that brings up volume, search and app access. Having this available from any application is cool. It's a solid performer, but it doesn't have that special wow factor, either.

Simon Chester





ASUS Eee PC 1025C

Big on price... but not on features.

www.asus.com.au

\$380

Faster than average netbook CPU, competent webcam. Skipping in speakers, small capacity battery, poor keyboard and touchpad.

ASUS may have invented netbooks, but today its offerings like the Eee PC 1025C-GRY041S simply aren't that impressive. It's got a decent enough new processor, but overall the small battery capacity and poor input devices render it a mostly uninteresting option.

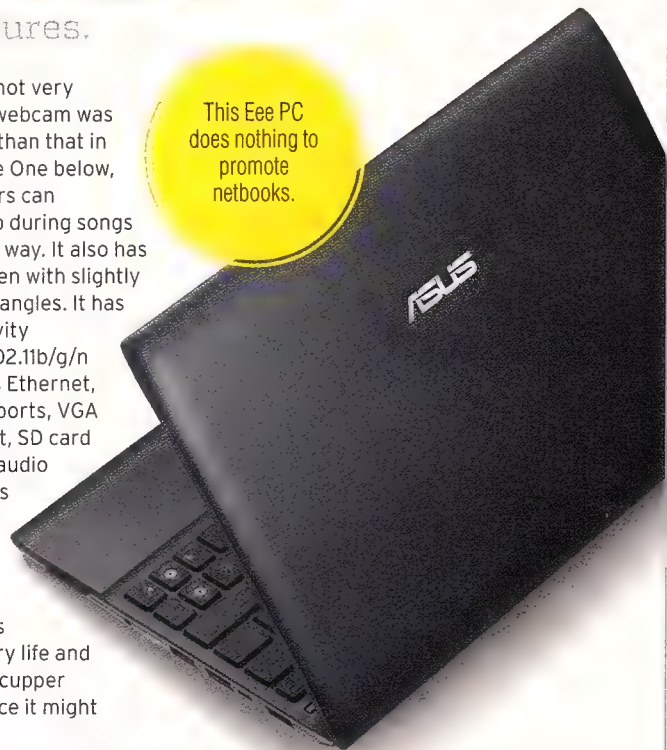
One tick for the 1025C is that it has an Intel Atom N2800, which is around 14% faster than the Intel Atom N2600. Otherwise the specs are a bit average: it packs 1GB DDR3-1066 RAM, a 320GB (5,400rpm) HDD and a 10.1in (1,024 x 600-pixel resolution) screen. Unfortunately it only uses a three-cell battery, resulting in a mediocre battery life of 3:33hr in Powermark on Balanced (with the 1025C's wireless off and power set to Balanced). It scored a decent 765 in PCMark 7, though.

The 1025C is built solidly enough, but the tiny keys on the cramped keyboard can cause reasonably frequent typos and the touchpad is

intermittently not very sensitive. The webcam was at least better than that in the Acer Aspire One below, but the speakers can sometimes skip during songs in a distracting way. It also has a brighter screen with slightly better viewing angles. It has good connectivity overall, with 802.11b/g/n Wi-Fi, 100Mbps Ethernet, three USB 2.0 ports, VGA port, HDMI port, SD card reader and an audio jack, but there's no Bluetooth.

Netbooks can still have a role to play, but the 1025C's ordinary battery life and input devices scupper whatever chance it might have had.

This Eee PC does nothing to promote netbooks.



Conrad Bem



Acer Aspire One D270

There's life in netbooks yet...

www.acer.com.au

\$350

Great battery life, pleasant keyboard, good connectivity. Poor webcam, ordinary screen.

Netbooks were always a bit marginal, but the Acer Aspire One D270 shows that the category is still alive and kicking.

Packing a new Intel Atom N2600, 1GB DDR3-1066 RAM, a 320GB

(5,400rpm) HDD, a 10.1in (1,024 x 600-resolution) screen and a six-cell battery, the D270 had a decent set of specs. The new CPU was about on par with a previous-gen Intel Atom N570, but it had better integrated graphics. In PCMark 7 the D270

scored 698, and in Powermark on Balanced (turning off wireless and switching the power profile to Balanced) it lasted an impressive 6:09hr. Compared to the ASUS Eee PC 1025C-GRY041S, which scored 765 and lasted only 3:33hr (due to a three-cell

battery), it's clear that overall the D270 was well ahead.

The AOD270's build quality is reasonable overall, and while quiet, the speakers are good enough for watching cats on YouTube. The screen is decent, but it isn't as bright as the ASUS's. We also found the webcam to be only passable. The keyboard was a pleasant surprise due to its large key size and comfortable layout and the touchpad is also likeable. The D270 provides good connectivity: it has 100Mbps Ethernet, Bluetooth 4.0, 802.11b/g/n Wi-Fi, three USB 2.0 ports, a VGA port, an HDMI port, an SD card reader, a headphone jack and a microphone jack.

If battery life is your sole concern, the D270 has you covered. The keyboard's great as well, so for long term-use it's a winner.

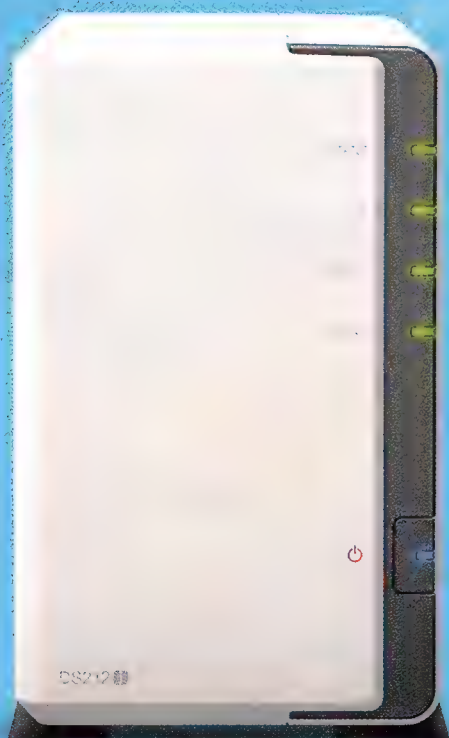
Conrad Bem

Much better battery life than the Eee PC 1025C above.



Synology

DiskStation DS212j



A secure personal cloud for your data

Access Data from Anywhere

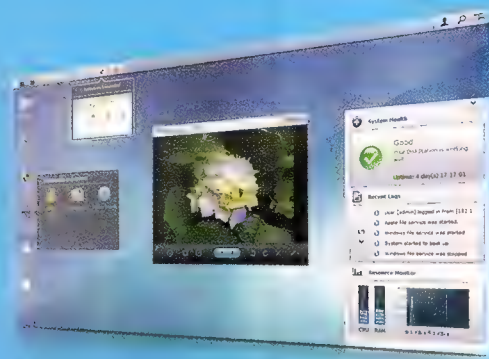
Sync with data automatically, anytime, from Mac, PC, and Mac OS X or features of multimedia collection on iOS (iPhone® and iPad®) and Windows® mobile devices.

Multimedia Center at Home

Stream your multimedia collections on DiskStation to any compatible electronic device (media player, TV, etc.). Sony® PS3 and Microsoft® Xbox 360. Enjoy ultra high-resolution video playback with support for all existing devices.

Energy Efficient Design

Options: eco mode, 10W standby power in standby. Support Scheduled Power Control feature.



DSM 4.1 Beta Testing, Join Now !
Try Video Station, revamped Audio Station,
new mobile apps, and more.

Distributed by

Accolades for Synology

More information



www.synology.com

9
10

Samsung Galaxy S III

The shape of things to come.

www.samsung.com/au
\$899 (16GB)

Extremely fast, great screen, good battery life. Samsung's own apps are mediocre, menu button feels cheap.



After many months of waiting, and not a small amount of hype, the Galaxy S III is finally here, replacing the Galaxy S II as Samsung's hero phone. It's an Android 4.0 smartphone with a 4.8in 1,280 x 720-pixel Super AMOLED display available (technically) in two colours, although at launch only the ceramic white was on sale; Samsung's apparently having some construction issues with the Pebble Blue variant.

The rounded shape of the Galaxy S III certainly makes it comfortable to hold and underneath the skin Samsung's packed a 1.4GHz quad-core Exynos CPU. Not only does this thing kick the backside of every other phone on the market in synthetic benchmarks, it's also just seriously quick in real-world application use.

Samsung's TouchWiz skin for the S III includes a number of software optimisations, although their utility is variable. 'Direct call', which calls the on-screen contact if you hold the phone up to your ear works very well. 'Smart stay', which keeps the screen switched on if it detects you're looking at it only works variably, and S Voice, Samsung's take on a Siri-like spoken word assistant, is still way too flaky to be worthwhile. 'Pop up play' – which lets you keep a video playing while multitasking another function – is cute but not that useful, especially as its implementation across different video types is spotty. It's a minor criticism, but the Galaxy S III's button layout could be better too, especially the needlessly thin main home button; the other two capacitive buttons perform admirably, but the home button

feels like a weak link.

The Galaxy S III is being stocked by all three primary carriers in Australia, but only in a 3G HSDPA+ compatible variant. It's a touch disappointing we won't see an LTE (aka 4G) version in Australia immediately; Samsung has said it's 'in talks' with Telstra, but that could be some time coming. The one benefit of that lower speed is power consumption, with the S III having the best battery life of a phone of this size. If you're a heavy apps or data user you'll still flatten its 2,100mAh battery within a day, but moderate use should see you through, something other phones often struggle with.

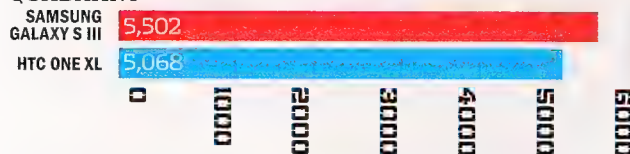
In the 3G arena, the Galaxy S III is an incredibly strong contender; it's not the fastest Android for data speeds (that's the 4G-equipped One XL) but it's the best all-round performer, even if some of its party pieces are a bit shallow.

Alex Kidman

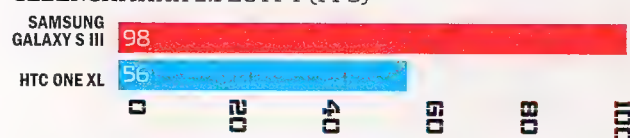


SAMSUNG GALAXY S III VS HTC ONE XL

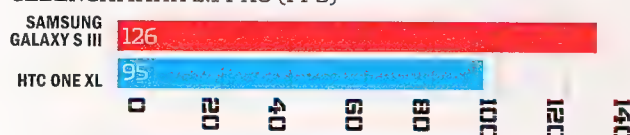
QUADRANT



GLBENCHMARK 2.1 EGYPT (FPS)



GLBENCHMARK 2.1 PRO (FPS)



9
10

HTC One XL

Faster, snappier... better.

www.htc.com/au
\$64/month for 24-month contract

Fast, great screen, great camera. No expandable storage, battery hog.



The One XL is Telstra's version of the very shiny HTC One X. This is HTC's flagship Android phone with the added benefit of 4G LTE. To accommodate that, though, there are crucial internal differences between the X and XL. Where the X has a quad-core Tegra processor, the limitations of current LTE chipsets means the XL has to make do with a dual-core Qualcomm Snapdragon S4.

The effect on real-world performance isn't that marked, however; it could change as Android developers really push quad-core-capable applications, but for now, relatively little separates the two lines. The XL's LTE underpinnings mean it can chew through power very quickly in 4G zones and since it's a sealed unit you can't carry spare batteries with you.

4G performance was very good – when Telstra's network was up to it we regularly hit download speeds

in the 20-40Mbps range during our tests.

HTC's learnt its lesson with skins and the version of Sense that sits on top of Ice Cream Sandwich is lightweight and works well. The One XL's camera is a little beauty, combining fast shutter speed with good colour reproduction, as well as the ability to capture snaps while shooting video. One minor catch for those keen on importing rather than contracting: the local version has 32GB of onboard storage, while import models are 16GB only. Because this is a fully sealed smartphone with no microSD slot, that's all it'll ever have. The One XL is an exceptionally good phone



Good 4G performance and a ripping camera.

and easily the best 4G model you can buy, but carry a spare charger or external battery with you.

Alex Kidman

5
10

HTC Titan 4G

Not exactly a Titan... possibly a Titanic.

www.htc.com/au
From \$79/month for 24 months

Only 4G option that's not Android. Poor screen, poor 4G reception.

The Titan 4G can lay claim to being the first non-Android 4G LTE phone Telstra's brought to market and if you're firmly within the Windows Phone 7 OS camp, it's the fastest thing you can buy. But unless you're committed to that camp, there's relatively little reason to do so.

It's not so much the single-core 1.5GHz Snapdragon processor at fault – WP7 is pretty darned good at drawing performance out of even the most meagre processors. WP7's Live Tiles flick around at a decent pace, proving once again that good underlying software architecture can make a lot out of a little.

The 4.7in display is nice and big if you like a larger phone, but WP7's limitations on screen resolution mean that it's limited to 800 x 480 definition, leaving things looking blocky in the extreme. It's also the

heaviest 4G phone Telstra sells at 163.8g. It might not sound like much, but it's considerable in the hand next to its 4G Android counterparts. Microsoft's storage limitations mean that the 16GB of onboard memory is all it'll ever have.

Even the lure of 4G isn't that strong. In our tests, the Titan was slow to connect at 4G speeds in new areas, while competing handsets snapped to 4G attention quickly. 4G speeds were only average when we did get a connection, so those dreaming of the Titan also being their hotspot should look elsewhere. Telstra offers a \$79 cap over 24 months, but we can think of other 4G phones we'd rather spend two years with.

Alex Kidman



Two years with this phone is too long.

8
10

ASUS HD7970-DC2T-3GDS

Aftermarket performance for an affordable price.



ASUS's huge cooler has lots of overclocking potential.

www.asus.com.au @
\$580 \$

Great overclocking potential, six-screen EyeFinity support. Physically huge, large cooler limits multi-card options. ✓
✗

The DirectCU II TOP range of graphics cards from ASUS is undoubtedly in the upper echelon of elite cards on the market.

While MSI's Lightning series is often thought of as higher end, the DirectCU II delivers similar features for a more affordable price and the 7970 variant is no exception.

The 7970 DirectCU II is fitted with a massive, over-the-top cooler, something we've come to expect from the series. Interestingly, when we removed the cooler we noticed two of the five heatpipes don't actually touch the GPU core – presumably a problem caused by ASUS reusing the same heatsink

design from its Nvidia GTX 580 DirectCU II card.

Featuring a factory-overclocked frequency of 1,000MHz core and 1,400MHz memory, a solid increase of 75MHz and 25MHz over the reference 7970, this card is built with raw power in mind. While this is still a hefty 70MHz behind MSI's Lightning 7970, those bold enough to manually overclock their card should find themselves over 1,200MHz with relative ease.

Also of note are an abundance of output ports, with two DVI ports accompanied by four full-size DisplayPort connectors, supporting EyeFinity

configurations of up to six screens from a single graphics card. Unfortunately, due to the massive form factor of the cooler, users are limited to two-way CrossFire configurations on most motherboards.

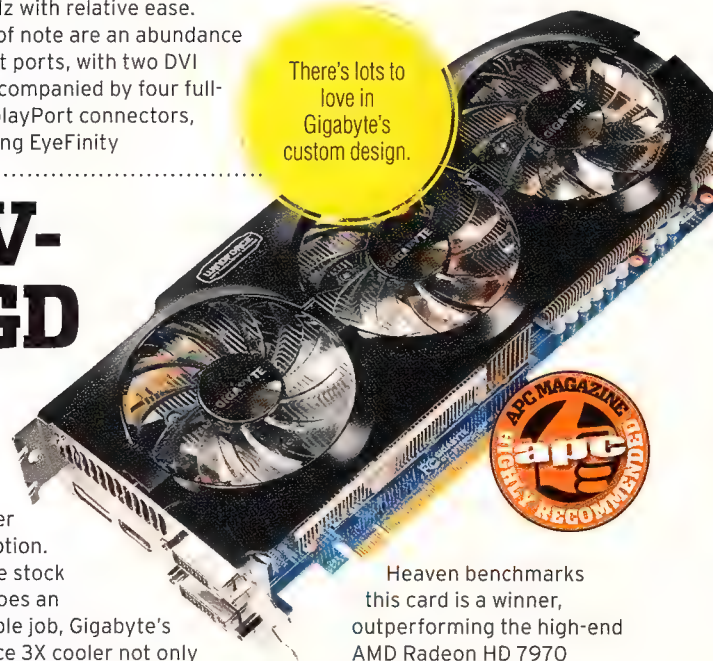
The ASUS DirectCU II TOP is a perfect candidate for those wanting the ultimate single-card AMD gaming experience.

James Trevaskis

8
10

Gigabyte GV-N6800C-2GD

Nvidia's GTX 680 gets a makeover.



There's lots to love in Gigabyte's custom design.

www.gigabyte.com.au @
\$720 \$

Overclocked 70MHz higher than the reference card. Can't turn off tessellation in the Nvidia driver. ✓
✗

What do you get when you take a reference Nvidia GeForce GTX 680, improve its power delivery, increase the cooling capacity and overclock it by more than 70MHz? A serious gaming card.

The Gigabyte GTX 680 OC is one of the first custom cards on the market and as its name suggests, it's been overclocked substantially over the reference model. Pushing the base clock from 1,000 MHz right up to 1,071MHz provides a sizable performance increase out of the box, but we think there's more in the tank.

Nvidia has done a great job of reducing the thermal output of the GTX 680, a knock-on effect from

lowering the power consumption. While the stock cooler does an acceptable job, Gigabyte's Windforce 3X cooler not only lowers the temperature, it also significantly reduces noise.

To support the additional overclocking headroom provided by the upgraded cooling, Gigabyte has added an extra power phase, bringing the total number of phases to five. This additional phase helps to distribute any extra power drawn as a result of raising voltages and increasing clock speeds.

Across both the 3DMark 11 and

Heaven benchmarks this card is a winner, outperforming the high-end AMD Radeon HD 7970 graphics card. Unfortunately, the inability to turn off tessellation from within the Nvidia driver slightly detracts from its appeal, denying the GTX 680 important additional fps.

Considering the additional features this card has over the reference design and mild price increase, we think the Gigabyte GTX 680 OC is great value for money.

James Trevaskis



Intel Core i5-3470

Ivy Bridge on a budget.

www.intel.com/au

@ \$250

Quad core, high Turbo speed, low TDP. ✓
Woeful GPU performance, minimal overclocking. ✗

The new third-generation Core i CPUs from Intel might not have made much of a splash for raw computational performance, but their HD4000 integrated graphics have made huge strides forward. The new i5-3470 is one of Intel's most affordable Ivy Bridge CPUs, but only includes the new HD2500 integrated graphics. So does it have the chops to stand up to today's games?

As the i5 name denotes, this is a quad-core CPU with no Hyper-Threading. A generous helping of 6MB of L3 cache helps feed the speedy CPU when it reaches a peak Turbo speed of 3.6GHz, making this an impressive CPU for x86 tasks, and even better when pushed to its maximum overclock speed of 4GHz. TDP is a mere 77W, making this one cool customer.

The integrated GPU has been severely reduced from the version

seen in high-end Ivy Bridge CPUs however, with the total Execution Units down from 16 to just six.

Intel claims graphics performance is around 15% faster than the last generation of HD2000 graphics, and our tests bore that out. Our *DiRT 3* test, run at 1,280 x 720 with middling settings, saw the HD2500 hit an average of just 33fps, up from the 29fps of the HD2000. These unplayable performance numbers continued across our tests, with *Battlefield 3* scoring a meagre 20fps at low quality.

It's obvious AMD has nothing to worry about from this CPU when it comes to integrated graphics performance. If you want to game without a GPU, the i5-3470 isn't the CPU for you. However, if you want a very affordable CPU for non-graphics duties, or to pair with a video card, the i5-3470 delivers plenty of bang for your buck.

Bennett Ring



Cooler Master TPC 812

A tower of heat-removing power.

www.coolermaster.com.au
@ \$85

Solid performance, quiet operation, not as big as dual-fan coolers. ✓
Not quite top-tier performance, still large despite single fan. ✗

Despite Ivy Bridge's move to a more energy-efficient 22nm process, the 3D transistor technology and smaller die size results in one steamy little chip when pushed to its limits. Tweaksters wanting to overclock Ivy Bridge need a high-performance cooler more than ever and the new TPC 812 aims to fill that need.

It does so by claiming to be the first heatsink to ever use vertical vapour chamber cooling. In non-nerd terms, this means that alongside the usual heatpipes are two large flat pieces of metal, filled with an unnamed liquid. As the liquid heats at the CPU contact point, it travels up towards the fins, where it cools and liquefies, before returning to the CPU. As far as we can tell, this functions the same way as a normal heatpipe, but within a wider pipe.

This is a multipurpose performer, with mounting kits included for all

current AMD and Intel platforms, including the big Socket 2011.

Installation is relatively easy, thanks to the clearly illustrated instruction sheets, though it's a little fiddly with so many pieces. At full speed the 2,400rpm 120mm fan emits an audible if subtle whir, but the included speed adapter drops it to a whisper-quiet 1,600rpm.

We tested at full speed on an overclocked i5-2500K, where it registered an excellent load temperature of 79°C, which puts it towards the front of the pack when compared to other coolers, such as the Thermalright Silver Arrow (77°C) and Noctua NH-D14 (75°C).

Cooler Master is onto something with the vapour chamber technique – with its twin chambers, the TPC 812 offers solid performance at a respectable price.

Bennett Ring



This single fan cooler almost keeps up with the dual-fan behemoths.



8
10

Cooler Master HAF XM

Plastic fantastic.

www.coolermaster.com.au
\$159

Plenty of fans, fan speed controller, good cable management. So much plastic, not exactly pretty, grille construction allows fan noise to escape.

The HAF in this midtower case's name stands for 'high airflow' and it's a term well deserved: this case has more fans than a U2 concert. Straight out of the box there are twin 200mm units at the top, 120mm on the rear and a 200mm fan on the front. As if that wasn't enough, there's room for several more, but you'd probably need to tether the case to stop it lifting off.

The space within is well utilised, with room for the largest video cards once several of the nine internal drive bays are removed. Despite their all-plastic construction, the tool-less mounting mechanisms for the bays are excellent and they can even handle 2.5in SSDs without an adapter. We're not so sure about the large plastic shroud that sits next to the PSU, used to hide the

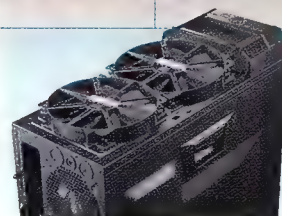


spaghetti-fied mess of power cables, but thankfully it can be easily removed.

The front panel includes the usual basics: twin USB 3.0, twin USB 2.0 and headphone/mic jacks. Less basic is the inclusion of twin removable 3.5in bays accessed from the front, as well as a speed control button for the case fans.

Our only complaint is the prolific use of plastic, which looks a bit cheap compared to metal cases, but it'll come down to a matter of personal taste. Regardless, this case has some of the best cooling

More fans than a U2 arena concert.



around at this price point, which is a godsend for those packing multiple GPUs and an overclocked CPU.

Bennett Ring

7
10

Corsair Vengeance C70

Ready for the virtual battlefield.

www.corsair.com
\$179

Distinctive military styling, built mostly from steel, cool reset button. Lacking in USB ports, simple cooling, overpriced.

Apparently there are still gamers in this age of broadband who attend LAN events. Why else would Corsair build the C70 with LANing in mind? But even if you won't be hauling this midtower around in your car, the distinctive military styling helps it stand out from the ranks of clones.

A couple of fold-out handles on the top make lifting the case a cinch, and it's surprisingly light given the full metallic construction. The sides are held in place by clips rather than screws, adding to the battlefield aesthetic – and there's also a military green model.

Inside the case is a fairly bog-standard design by comparison. Three 120mm fans (two at the drive bays, one at the back) deliver a decent blast of moving air and there's plenty of space for more. The six 3.5in drive bays are made

of a flimsy plastic, though it's unlikely they'll cop a beating provided you keep the side in place. The motherboard tray has a CPU cutout, with room for Corsair's prebuilt water-cooling kits. The front face plate has just two USB 3.0 ports and headphone/mic jacks. The reset button is hidden behind a shield, as if your PC would burst into flames if you pressed it.

Feature-wise it's rather unremarkable, especially considering the price, but we reckon it'll sell by the truckload to those obsessed with military killing simulators such as *Call of Duty* and *Battlefield*.

Bennett Ring



A military-style case for shooter fans.

7
10

CM Storm Quick Fire Pro

A mechanical keyboard without all the fuss.

www.rectron.com.au @

\$109 \$

Partially backlit, solid build, ✓

dedicated media keys.

No gaming keys, noisy, pricey. ✗

In today's competitive gaming environment, it's all about having the gear that will give you even the slightest extra edge. Thanks to Cherry MX switches, mechanical keyboards have seen a huge resurgence in popularity, with most peripheral manufacturers sporting at least a model or two.

The Quick Fire Pro is the latest gaming keyboard in the CM Storm lineup. It's aimed more at FPS players than MMO-ers and doesn't feature any extra gaming keys, though it has partial red backlighting on the common gaming keys (WASD, arrows and numbers) as well as media buttons on the function keys. It includes a removable braided USB cable, can disable the Windows key and has a 1,000Hz polling rate.

Like other CM Storm keyboards, you can buy four different versions with black, blue, brown or red keys for different feels. Our test model had blue keys for low resistance and



Solidly built, with four versions for different keyboard feels.

good tactile feedback. In real-world use this translates into very easy-to-press keys, with a distinct click feel and loud noise. The keys are quite tall and have concave faces with sharp edges. While this gives a somewhat different feel to a normal keyboard, after a solid gaming session we had adjusted and found

it quite fast and accurate. The letters and numbers are laser-etched into the surface of the keys to avoid any long-term wear.

The Quick Fire Pro weighs in at 1.3kg and is extremely solid on your desk, but at \$110 online, it's not one of the cheapest options.

Lindsay Handmer

8
10

Tritton AX 720

The Swiss Army knife of headsets.

www.hes.net @

\$190 \$

A great headset for anyone needing to connect to the PC and multiple next-gen consoles or home theatre gear. ✓

Lacking a little in the low end, cables... so many cables. ✗

And it's ready to slice, dice and serve up your audio. Brand choice for Aussie connoisseurs of fine gaming audio has quite literally exploded over the last year, with more and more well-established and revered international manufacturers finally making their way across the water.

Out of the box and on the head, Tritton's AX 720 feels oppressively heavy but surprisingly comfortable (considering its robust, rigid, *Tron*-esque styling) with pivot-points where the head-rail and cans meet, and one on the cans themselves.

There's a boom mic on the left cup, which can be removed – a nice touch – and a set of in-line controls putting volume, mic and voice monitoring controls comfortably within reach. The audio money-shot comes with desktop Dolby Digital Decoder, which did a decent enough job of taking a 7.1 source and

directionalising it, but it's let down a little by single 40mm drivers that are a bit weak in the bottom end.

While it can connect to almost any device that produces sound, all that versatility comes at the price of a mountain of cabling. Unless you're packing reasonably new hardware with digital optical output, you're in for some fancy jiggy to get things up and running – though thankfully all the cables you'll ever need for any situation, ever, are included in the box.

The AX 720 fell just short of becoming our new everyday headset; for everything it offers, we were still left wanting a little more. Throw in a little more comfort, a little less weight, a lengthier digital cable and multiple optical inputs and the AX 720 would go from significant to stellar.

Troy Coleman

Slight design shortcomings hold this set back.



7
10

Canon Pixma MX895

Stylish, but lacking in the web department.

www.canon.com.au @

\$230 \$

Duplex scan and print, dual paper feed. ✓

Limited cassette capacity. ✗

The MX895 is the latest in a long series of inkjet all-in-ones from Canon. Its features include USB, Ethernet and Wi-Fi connectivity, faxing, a small (3in/7.6cm) yet clear and bright display, and a set of buttons that are backlit to show only the relevant controls.

The first page of our test document printed in 22 seconds, page two emerged after another 10 seconds for a run-on speed of 6ppm, compared with the nominal 9.3ppm. The quality matched other models in the same price bracket.

The MX895 is billed as an office printer, but since it's part of the Pixma range we printed our regular set of photos. It took a respectable 38 seconds to print a 10 x 15cm image with the usual Canon quality. Stationery, like graph paper, can be printed on demand, with more designs at Canon's web service.

The MX895 is supposed to be able to print from Picasa albums;



The Canon can reduce show-through when scanning double-sided originals.

however, when we tried, while our albums were visible, the printer wouldn't fetch individual images.

We used an iPad to successfully test the built-in support for AirPrint. Printing from Android devices is also supported via a free app. The MX895 is billed as working with Google Cloud Print, but our review sample required a firmware update. The device can scan and print to or from

USB storage or memory cards. Direct printing from PictBridge-enabled cameras is also supported. Scanning and copying gave good results, with slight banding on colour copies. We liked the ability to reduce show-through when scanning double-sided.

Stephen Withers

7
10

Lexmark OfficeEdge Pro5500

Good use of a touchscreen.

lexmark.com.au @

\$499 \$

Web connectivity, duplex scan and print. ✓

Bulky, noisy. ✗

Unashamedly business-oriented, the Pro5500 is on the large side, but has some worthwhile features. Like a growing number of printers, it's web-enabled through Smart Solutions that can be installed via a web site. These provide PC-free access to online services, from RSS feeds through to MapQuest maps and photo services like Photobucket.

Depending on the function, content is displayed on the 4.3in touchscreen or printed. Scanning directly to Box, Evernote and other services is also supported.

We tried Scan to Box – the file arrived in the right place, but the SmartSolution consistently hung

at the end of the process and we had to put the Pro5500 to sleep via the power button.

SmartSolutions also condenses multi-step processes into one-touch operations, such as 'Copy and Send to Computer'. Some involve emailing documents and if you make a mistake when setting up the account details, there are no diagnostic messages, but Lexmark plans to address this in the future.

Copying gave good results with no banding, but as inkjets go, this is

Good quality prints, but a bit on the noisy side.



on the noisy side. The first page of our business document printed in 14 seconds. Page two took another 7 – well below the claimed 'up to 14 ppm' and duplexed output more than doubled the time to 45 seconds.

The quality of text and graphics was good, and the ink is water- and highlighter-resistant. We had to clean the print head, but Lexmark says this is sometimes necessary.

Stephen Withers

7
10

Sony HMZ-T1

That's one giant leap for virtual reality.

\$899 @

www.sony.com.au

Excellent image quality, stunning 3D, cheap considering the image size. Fiddly mounting system, slightly heavy, can only be viewed by one person.

Although it's designed for use with a PlayStation 3 or Blu-ray drive, the real potential of this new head-mounted display (HMD) only shines when it's paired with the sheer power of the PC. When attached to a gaming PC, the HMZ-T1 single-handedly revives the dream of viable virtual reality where so many other headsets have failed.

The key technology that makes this headset so promising are the twin OLED displays, each running at a native resolution of 1,280 x 720. Compared to other consumer HMDs this is a huge leap in resolution, and the OLED technology delivers vastly superior image quality. It's still not quite sharp enough to be pin-sharp, but it's more than bearable. A jump to 1,920 x 1,080 would remove any sign of pixels, so we hope the next version packs true HD screens. Each screen might only be the size



We can't wait for version 2.0.

of a postage stamp, but their proximity to the eye delivers an image that appears to be 750in wide at a distance of 20m. Each eye is given a totally separate image, unlike the technological trickery of other 3D solutions, resulting in the best 3D image we've ever seen, bar none. When paired with a head-tracking unit, such as the TrackIR 5 Pro, users really are placed inside the game world. It's amazing.

Unfortunately, the headset isn't

without its problems. Each screen must be precisely positioned to maintain a clear 3D image and the mounting system just isn't up to the task, requiring frequent adjustment. It's also a little bit heavy, leading to neck fatigue after a few hours.

Despite these flaws, the HMZ-T1 is a remarkable product, hinting that working VR is just a year or two away. We'll be waiting with bated breath for version 2.0.

Bennett Ring

7
10

ASUS P1

Is this the start of an LED projector revolution?

\$599 @

www.asus.com.au

Long-life LED lamp, DLP chip, comparatively bright. VGA input only, no zoom, mildly noisy.

LED projectors can be disappointingly dim and unusable outside a very dark room. The ASUS P1 is a different breed, with a brightness of 200 lumens. While that's 10 times dimmer than an average home cinema projector, it's also 10 times brighter than most LED projectors we've tested.

It also has 1,280 x 800 resolution and uses red, green and blue LEDs coupled with a 0.45in DLP setup. It can display 16.7 million colours and has a 2,000:1 contrast ratio. It's also got a 30,000-hour lamp life, which while non-replaceable, equates to eight hours of use every single day for the next 10 years. In testing, the

P1 was surprisingly bright and could easily project a 1.5m screen with the lights on. With a dimmer room, a 2m screen is usable, but you only get focus control, not zoom. It has automatic keystone adjustment, which makes setup easy.

While the P1 is aimed at business use, image quality is good enough for movies and handled fast scenes without a problem. It did produce a muffled whine, however. It has a tripod socket on the bottom and



Ten times brighter than most LED projectors we've tested.

takes power from a standard 19V laptop mini-brick. Its most annoying shortcoming is that it only has VGA input via its own special cable. Not including HDMI is a big mistake, as newer equipment has largely ditched VGA. As there's no card reader or USB ports, you can't play media files or a slideshow directly either.

Lindsay Handmer

8
10

Sony Vegas Movie Studio HD Platinum 11

Professional Hollywood-style editing suite.

There's a cleaner interface, but a big monitor is still critical.

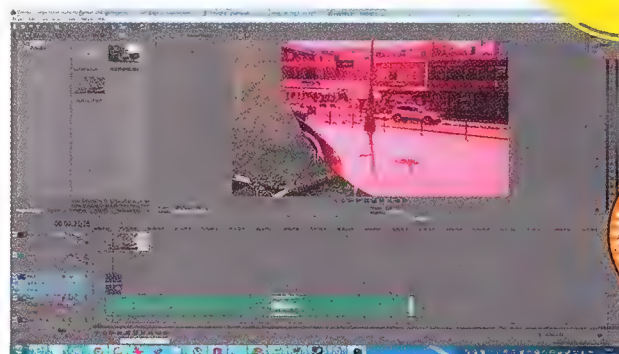
www.sonycreativesoftware.com
\$169

Improved interface and usability, built-in effects and green-screen compositing. Light on truly advanced features, some tools well hidden.

Movie editing packages typically have to strike a balance between being powerful and easy-to-use. Windows's own free Live Movie Maker is enough for most casual users, but if you're after a more powerful tool then Sony's Vegas Movie Studio HD Platinum 11 is a step up. It's essentially a stripped-down version of Sony Vegas, so you get lots of nice effects, but a lack of advanced features like the ability to run custom scripts.

Previous incarnations of Movie Studio have been almost drowned by their busy interfaces. The latest version is improved considerably, and there are tutorials to guide you through tricky bits, but you'll still want at least a 24in monitor.

Other improvements include Blu-ray authoring and stereoscopic 3D editing - for which the package even



includes some anaglyph 3D glasses. You need a dual-lensed 3D camera to make the most of it, but it's powerful and includes adjustments for 3D depth levels.

Green screen compositing and split screen techniques make it ideal for budding visual effects maestros, while video stabilisation and colour

correction can bring ageing videos back to life.

While it won't threaten the likes of Final Cut Pro but Vegas Movie Studio is still a powerful - if slightly formidable - way to make your home movies that bit more interesting.

Henry Winchester

6
10

Roxio Creator 2012 Pro

Organise and back up your photos.

www.roxio.com
\$189.95

Lots of media tools in one package. Some filler, many tasks can be done with free options.

Roxio Creator 2012 Pro comes with lots of tools but, while some can prove to be very useful, at times it feels like there's a bit too much filler. It's one of those suites that will install features throughout your OS, so prepare for Roxio Secure Burn to pop up on your desktop, with Roxio Burn Disc Viewer installing itself in the 'My Computer' folder as a drive. Of course, you can always pick and choose the tools to install during set-up, but if you disable a lot, it makes buying it as a package a bit redundant.

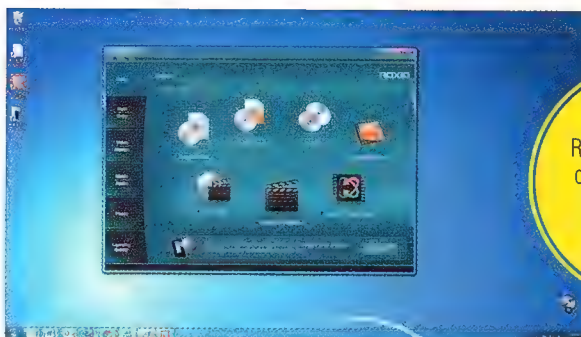
Importing photos from a digital camera is handy for filtering the image files as well as batch renaming them. You can also import photos through the Roxio Media Manager, which you can use to synchronise your photos from a number of devices. This is a handy

tool if you have cameras from a number of manufacturers, along with a smartphone. After a quick scan, Roxio Organiser added photos it found on our test PC. Advanced searching options let us find photos by date, size and keywords, though there are no location-based searches for our geo-tagged images.

Roxio Creator 2012 Pro comes with some excellent back-up tools, as well, which are quick and easy to use and great for backing up your

photo collection. However there are cheaper back-up and organisation tools available that do the job just as well, if not better. With Roxio Creator 2012 Pro a lot of what you're paying for covers features and tools you might not need. The 3D photo creator is fun yet ultimately useless, while the Panorama and Slideshow features can be found in free software such as Windows Live Photo Gallery.

Matt Hanson



Roxio packs in lots of tools, but some are more useful than others.

4
10

MyPC Backup

A backup service with its head in the clouds.

www.mypcbackup.com

from US\$6.95

Free trial period, reasonable initial pricing.

Hidden fees, other free options available.

MyPC Backup is the latest company offering to back up all your files in the cloud. And we do mean all – it's one of the few companies to offer unlimited storage.

On signing up for a 14-day trial, you're asked to install a piece of software to manage your backups. It defaults to My Documents but you can choose any folder. It also offers a handy Dropbox-esque Sync folder, in which new files are copied both ways. At the end of the trial period your subscription options are: Home (75GB of storage), Premium (250GB) and Unlimited. Prices start at US\$6.95 a month for Home to US\$9.95 a month for Unlimited, but there are discounts if you pay for a one- or two-year subscription.

It's here that certain alarm bells start to ring. As soon as you've signed up for an account, you're invited to upgrade. You're presented with a range of options, such as Supercharged Backups for faster

uploads and Hourly Backups to increase the number of uploads from once a day to once an hour. These are standard features on cheaper services like Carbonite and the Supercharge feature suggests customers who don't pay the extra fee are likely to have their bandwidth throttled.

It's also becoming apparent that online backup services like MyPC are facing towering competition from the likes of Google and Microsoft. Google's recently launched Drive service gives users 5GB of free cloud storage, which isn't a huge amount, but the fact that it's nicely integrated with Google's ecosystem makes it far more attractive than MyPC's offering.



It does what it states, but there's better options available.

Although on the surface MyPC Backup seems like a useful service with practical features, the reality is there are a number of additional costs. There are better, cheaper services out there and given most people's important things are backed up to Google Docs, Facebook, Dropbox or Flickr renders it borderline redundant.

Henry Winchester

6
10

iClone5 Pro

Comprehensive or compromised?

www.reallusion.com/iclone

Standard, US\$79.95;

Pro, US\$199.95

Real time scene creation, low price, Kinect capture support.

Slight learning curve, results don't look like real sets.

Budding filmmakers have never had more options when it comes to animation packages. Spielbergs on a shoestring can log on to www.xtranormal.com and use pre-rendered backdrops and characters to tell a story. Hopeful Hitchcocks can take a more inventive route and use game engines, such as Valve's Source, to

create movies known as Machinimas.

iClone5 sits somewhere between the two. It's basically a game engine, but rather than creating levels or maps you're creating sets and scenes. Anyone who's ever tinkered with game development kits will find it intimately familiar, but the difference here is that iClone5 has been built from the ground up to make movies instead of games.

In the centre of the screen sits a real-time rendition of your scene, complete with lighting and animations. The advantage of the real-time view is that you don't have to wait an interminable amount of time for your movies to render, nor do you have to worry about it all going wrong during this process. iClone5 describes itself as a 'what you see is what you get' package, making it refreshingly

straightforward for beginners.

There's a slight learning curve here, but it's nowhere near as steep as the ones found in programs such as Autodesk 3ds Max or Blender. Unlike those packages, you won't be working from scratch – iClone5 includes vast libraries of backdrops, characters and sets, as well as an online store and an import function for models from Google's SketchUp 3D package.

The latest version comes with Kinect motion capture, too, so if you've got a Kinect for PC unit you can use it to control characters' movements by jumping up and down maniacally in front of your PC. If there's a problem with iClone5 it's that the results simply aren't polished enough and look like clunky 2005-era games. It does make an ideal starting point, though.

Henry Winchester



Connect your Kinect and make your characters jump around like loons.

70 bestapps

LATEST SOFTWARE



Google Play

Öffi – Public Transport Buddy

Worldwide public transport planning.

Free > Andreas Schildbach > tinyurl.com/7jmbu7

Öffi is a worldwide public transport manager that's of particular use to anyone city-hopping. I still use TripView for my regular commute, but if I find myself in a strange part of Sydney or Melbourne, then Öffi provides a great means of finding the nearest stop, connections you need and the different options available.

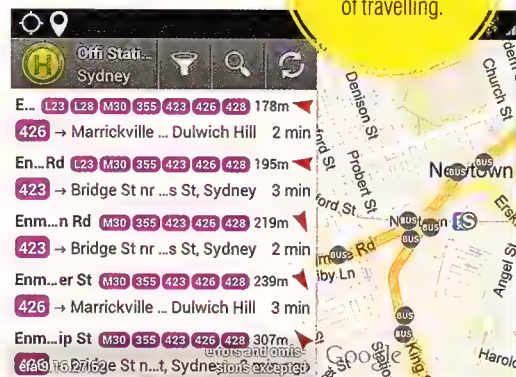
The app is divided into three apps: Öffi Directions (for navigating address to address), Öffi Network Plans (to view maps of transport networks) and Öffi Stations (which shows you the nearest stations, bus stops and routes).

The interface is rather busy and a far cry from attractive, but the chart-like display of

transport options is a pretty effective way to view the many different transport options on a single screen. Of course, the app is designed for countries with reliable public transport, so some of the features (such as monitoring your upcoming stop) don't work with any accuracy when your bus is running late.

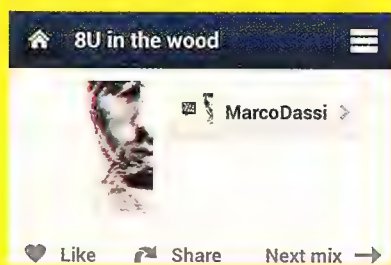
However, if you plan to travel to one of the supported countries (UK, USA [San Francisco and Philadelphia], Germany, Switzerland, Belgium, Luxembourg, Liechtenstein, Austria, Netherlands [Amsterdam], Denmark, Sweden, Norway [Oslo and Bergen] or Poland), this app can save you a lot of trouble.

Turns public transport into an effective method of travelling.



8tracks

Free > 8tracks > tinyurl.com/7zrd4tc



Browse and discover playlists created by fellow users, browse music by tag, or subscribe to your favourite users to hear their latest playlists. However, the final 'mix' product isn't really a mix at all – there are gaps between every song. With so many great DJs out there putting out mixes that segue between tracks, this can be a little frustrating, but it's still a great way to find music to fit a certain mood.

Office Suite Pro 6

\$15.39 > Mobile Systems

tinyurl.com/7whhb4z



Office Suite Pro 6 provides a means to view, create and edit Word, Excel and PowerPoint files on your Android phone or tablet. It's handy for anyone still stuck in Microsoft's world, but less so for anyone who's transitioned to the free Google Docs. However, as far as mobile office apps go, it's as full-featured as they come, giving you the option to leave the laptop at home. It includes a PDF viewer, but sadly not an editor.

Grabatron

\$1 > Future Games of London

tinyurl.com/7vg4xc8



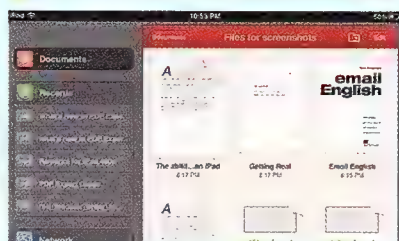
Grabatron is sort of like a destructive version of those grab-the-teddy-with-the-claw machines. You play a UFO that's come to Earth to pick up and fling heavy objects in a flurry of destruction. There are 30 levels, a choice of tilt or onscreen controls, power-ups, OpenFeint support and all the redneck-abducting, caravan-flinging action you could ever want. The cool GrAbATTRROoOoOn! opening sound tickles me every time I hear it.



App Store

PDF Expert

i \$10.49 > Readdle > tinyurl.com/7vxvdt



Mobile browsing has become the norm these days, but there are still some things you often can't do without a fully-fledged PC on hand. One common boon of the iOS netter is PDF support. PDF Expert allows you to access, annotate (highlight text, make notes or draw with your finger) and fill out PDF forms from your iOS device. Better yet, you can grab documents from email, iDisk, Dropbox, Google Docs and other online services, via USB or Wi-Fi.

Exponential Invasion

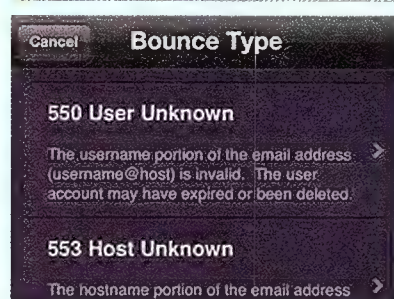
i \$2.99 > Danny Perski > tinyurl.com/7wh83gr



This is a visually minimalistic yet interesting take on the classic (and rather common) tower defence game. Rather than using images to display towers/soldiers, Exponential Invasion shows them as numbers. You capture enemy towers by putting together a higher number (like most tower defence games). The trick is to combine numbers as efficiently as possible, as resources are limited. It's a little too short, but hopefully that will change in the future.

BounceMyX

i 99c > C2SaaS > tinyurl.com/7xhdnpp



A cheeky app that allows you to filter out annoying pen pals by sending a fake 'bounce' email so you can pretend you never received that awkward invitation to cousin Henley's accordion recital. You can choose from 550 User Unknown, 553 Host Unknown or 554 Mailbox Full. It only works on IMAP email accounts, so if you're a POP3 type, buy earplugs.

Zombie Carnival

An endless runner that stands out above the horde.

i 99c > Mobigame > tinyurl.com/7eft5lp

There are few themes more clichéd these days than zombies. Likewise, there are only a few game genres on iOS more overplayed than the Canabalt/Jetpack Joyride endless runner. Yet Zombie Carnival has produced something polished enough to shamble with the big boys. One difference is the fact that you aren't a single player in this game. You start as a single zombie, but as you progress you'll find countless humans waiting for consumption and subsequent zombification, increasing the number in your horde. No matter what befalls members of your zombie troupe, as long

as there's at least one zombie left, the game will continue. Additionally, bigger hordes can break into cars and buses, further adding to your brain count.

Part and parcel of releasing games these days, of course, is inbuilt addiction generators. All the standard ones are found in this game: leaderboards; a neverending, yet staggered, list of missions and rewards for completing them; a store to spend (or purchase) those rewards; occasional random rewards; and just like a poker machine, no real end to the game.

Despite this, though, there's barely

Polished enough to scramble with the big boys.



a game out there that doesn't throw in a few tricks of psychology to keep the user engaged, and frankly, I don't fall for such things anyway...



App World

Chromasphere

All the tilty roly goodness you could hope for.

i US\$0.99 > redmotion games > tinyurl.com/8xokyfa

It's a crazy marble rollathon! Tilt your PlayBook side to side to guide the marble through the maze in the fastest time possible, without falling off of the edge.

Of course, this isn't a fresh premise, with games dating back to the earliest ages of video games, and even further back in time when you consider their wooden RL counterparts. However, since the Wii's magic motion controllers came along, these games have seen a resurgence.

And now, with the wonder of tablets, the genre has now moved full circle, with a board-like digital contraption emulating the board-like contraptions of yore.

You'll find the usual colour-coded keys (they're crystals in this incarnation) –

which need to be collected before you can open doors, flick switches, cross bridges and so on – and moving platforms that have been making an appearance in the genre for decades now.

This particular version of roly marbly games stands out because of its attractive graphics and engaging storyline. OK, I made up the storyline part, but the graphics are attractive.

At the time of writing, the developer stated that the app is still in 'beta' status, but I came across no real problems. One feature I'd like to see would be the ability to calibrate 'flat'. On a better note, the developer has also stated that it's adding to the current 18 levels.

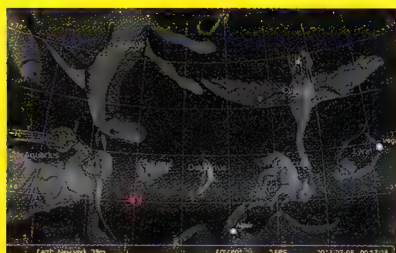


Tilt PlayBook left, tilt PlayBook right — this is fun!

Stellarium (Astronomy StarMap)

i US\$1.99 > 1871260 Ontario Inc

tinyurl.com/7lozvkl



Based on the open-source Windows/Linux project of the same name, this app condenses the infinite wonder and scope of the universe into a nifty, tablet-sized augmented reality app. Point your PlayBook to the sky to see what wonders lie light years beyond our atmosphere, or manually navigate any of the views. You can zoom in on any of the many constellations or asterisms ('unofficial' constellations) and see them with or without their dots connected.

Word Craze

i US\$0.99 > SRID Games > tinyurl.com/7febfgfx

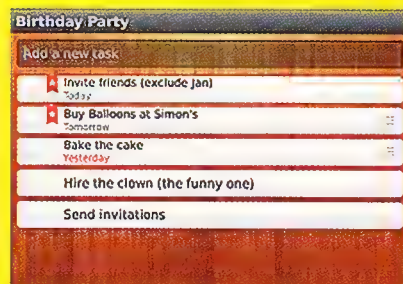


Word Craze is an entertaining word game where you need to make as many words as you can from the provided five letters. It's a very simple concept, but I found that I was playing it for far longer than I thought I would. The addition of BBM integration further improves it – since games are always more fun when you personally know the person whose ass you're a-kickin' – as does the self-described, pseudo-English 'eye-contagious interface'.

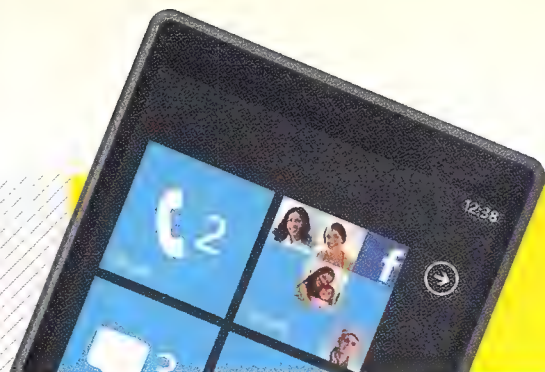
Wunderlist

i Free > 6 Wunderkinder GmbH

tinyurl.com/78wuejw



Task list apps are a staple of any smartphone owner. I'd be lost without mine and with the plethora of different devices that fill my life, the addition of some kind of cross-platform, cloud-based sync is a requirement that I take very seriously. I can edit my tasks on my PC (or Mac/Linux) and have them appear on any of my iOS, Android, BBOS or WP7 devices. In this sense, Wunderlist ticks not only my completed tasks, but also all of my boxes.



Marketplace

MonsterUpAdventures

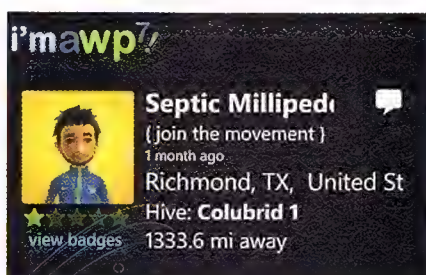
i \$2.49 > Marios Karagiannis
tinyurl.com/cweh5uw



The sequel to the Doodle Jump clone MonsterUp, this app changes the game mechanics a little – a welcome move in this tried-out concept. The levels now have a finish line, making them a little more compelling, and there are bosses to defeat. Like in the original, the monsters all have different abilities, but now they're unlockable by collecting booty or through in-app purchases. I love the new graphics and sound.

...I'm a WP7

i Free (\$3.49 for extra features) > Liquid Daffodil
tinyurl.com/7uitl6s



...I'm a WP7 is sort of like a social network for WP7 users, but it's not trying to be a Facebook replacement. It's really a good way to find fellow local WP7 users or Xbox gamers, but also provides WP7 tips, tricks and news, which will be useful to any new WP7 owners. Additionally, there's a long list of extra features, including utilities, messaging, the ability to check in to a place across multiple social networks, wallpapers, ringtones and even some Easter eggs. Worth a look.

Photosynth

i Free > Microsoft Corporation
tinyurl.com/89t8btg



The amazing Photosynth 3D photo-stitching technology that Microsoft developed many years ago has now come to WP7. With Photosynth you can snap photos of your environment – whether that be north, south, east, west, up or down – and automatically turn them into an interactive, sharable sphere-like 360° panorama. If you're not into the whole interactive thing, it also allows you to export just regular old photo stitches. It's pretty much the best photo-stitching product available.

Portals 2D

It's like Portal... in 2D.

i \$1.49 > Weesals > tinyurl.com/7luss4o

Portal was a great game made fantastic by an intriguing concept. Basing itself on part of that concept, Portals 2D is a top-down, push-the-block puzzler that involves, yes, portals.

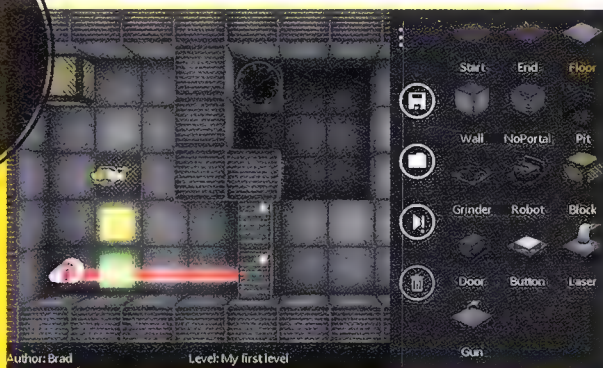
I'm a bit of a sucker for puzzle games (as you may have noticed) and this is a standout indie release by an Australian developer, which I must admit, makes me a little proud *wipes patriotic tear from eye*.

The object of each level is to reach the elevator, so you may climb up to the next. There are 24 levels, but a recent update

introduced a level editor and community level catalogue, which is a welcome addition. However, as with any user-generated content, the quality is widely variable. There's some gold hidden among the mud, but panning is a difficult pastime.

The app appears to be under heavy development, so hopefully level ratings will be added soon. In the meantime, you can view how many times a level has been played/completed and its difficulty. Future

The object of each level is to reach the elevator to climb to the next level.



updates have promised to bring the ability to share a/your level with friends, as well as being able to save custom levels locally.

I found the graphics stark but appealing, which suits the overall aesthetic of the original that inspired it.

Secrets of steganography

Julian Bucknall explains how to send secret messages without needing encryption.

Using one of the standard encryption algorithms is a great way to get a message from one location to another without anyone understanding the message. However, what if you want to get that message across without anyone even knowing there's a message to intercept? Enter steganography, the concept of hiding communications (messages, data, files and so on) within another object. The hiding is done in such a way an observer won't realise there's a hidden message.

These days many people view steganography as embedding messages inside images (and we'll discuss that), but it has a long and illustrious history. Herodotus was the first to mention a steganographic technique, writing a message on the inside surface of a wax tablet and covering it with wax to look like an ordinary writing tablet. When

I was a boy, the accepted technique was writing a message in invisible ink – we used lemon juice to write in the white space of another ordinary (and probably extremely

boring) letter. Heat the paper up and, voilà – the hidden message is revealed!

ALPHABET FOR BACON'S CIPHER

A = aaaaa	I/J = abaaa	R = baaaa
B = aaaab	K = abaab	S = baaab
C = aaaba	L = ababa	T = baaba
D = aaabb	M = ababb	U/V = baabb
E = aabaa	N = abbaa	W = babaa
F = aabab	O = abbab	X = babab
G = aabba	P = abbba	Y = babba
H = aabbb	Q = abbbb	Z = babbb

BACON'S CIPHER

An ingenious method of steganography was invented by Sir Francis Bacon, contemporary of William Shakespeare. He devised a cipher, where the hidden message is disguised in the visual appearance of the normal text and not in the text itself. The cipher's alphabet is shown above. Let's encode the word 'secret' using this alphabet. We get baaab aabaa aaaba baaaa aabaa baaba. The trick now is to write some normal text that has nothing to do with our secret message and then disguise this encoding within the visual representation of that text.

Bacon devised a Bilateral Alphabet for this disguise. This written alphabet had two different forms for each capital and lowercase

letter, and, in writing out the normal text, Bacon would use the first forms in place of the 'a's and the second forms for the 'b's. It's hard to do this in a printed magazine, although I'd like to see someone try with Arial and Helvetica as the two forms).

Since we don't really send hand-written letters any more, and the equivalent in print is quite obvious, other methods have been devised. A great one is to convert each 'a' in the encoding to a word that starts with the letters A-K, and each 'b' to a word that starts with L-Z. So: 'Dear Ben, did you know Ethel's dog is in fact unwell? I await your correspondence,' becomes 'aaaba aaaaa baaba', which spells the hidden message — 'cat'!

WAR OF WORDS

World War II and the Cold War brought forth a slew of new steganographic techniques. First, and possibly the most famous, were microdots: photographically reduced images roughly 1mm in size. They're called dots because they tend to be smaller than the full stop produced by a typewriter (or the dot or tittle above 'i' or 'j').

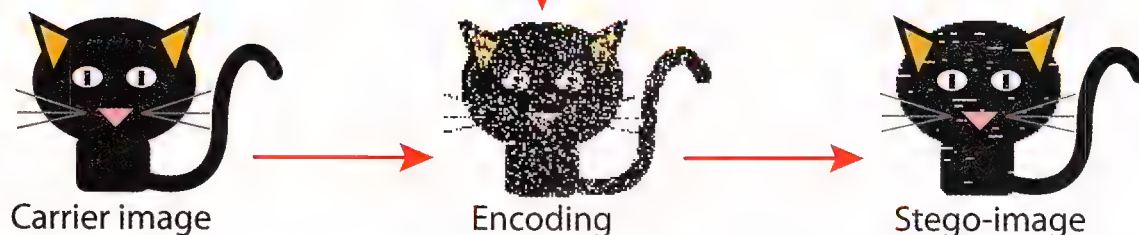
The microdot is then stuck to an ordinary document (such as a postcard, typewritten letter or envelope), somewhere that wouldn't cause undue attention. The theory goes that the mail inspector wouldn't notice the microdot, letting the letter or postcard through. The recipient would then use a microscope to read the message.

Another technique was to embed a message in a normal-looking letter by using code words (using the word car which actually means plane, for example). This procedure was used by Velvalee Dickinson, a spy for Japan against the US during WWII, who would send letters to addresses in South America that purported to be for her business in trading dolls.

In reality, these letters reported ship movements and other secret information encoded as code words in the text. Yet another technique is to embed the message as every fifth word, say, in a normal letter. This embedding technique, although appealing, is difficult to use for complex secrets, for example. Text containing this type of message tends to appear stilted.

Despite these ingenious ways to hide information in full view, it wasn't until the digital age, and especially the PC, that steganography came into its own.

Payload **This is a secret message**



WORDS IN IMAGES

Before discussing digital steganography, I need to emphasise that its purpose is to transmit a message from one person to another. Unlike cryptography, the object of the exercise is not to physically send the hidden message (and thereby inform all listeners that something's going on, even though the message may be undecipherable), but to place the encoded message in plain view but only the recipient can decode it.

I should define a few terms before continuing. The first is payload. A payload is the secret message we wish to get to our counterpart. The carrier is the file or stream we hide the payload in, and once we've hidden it, the resulting file or stream is called the stego file or package (see above). The channel is the type of file of the carrier. So, for example, if I want to embed my payload in a given picture, the image is the carrier and the channel is the JPEG format.

And that example brings us to possibly the most famous steganography technique – embedding the payload in an innocuous image. Let's consider the simplest channel – a bitmap image. In a 24-bit bitmap (a BMP file in Windows), each pixel is defined by three bytes. The first is a red level, the second green, the third blue. Each level has 256 different values from 0 (off) to 255 (full on). So, black is represented by (0, 0, 0) and white by (255, 255, 255).

The interesting thing to note is that the human eye is pretty bad at discerning very minor differences in intensity, especially for a single pixel. The difference between, say, 01010101 and 01010100 in the blue channel (or red or green) would be hard to discern on a pixel by pixel basis, especially for a busy photograph. Hence we could, for example,

use the least significant bit of each of the colour levels to encode a message. Instead of colour levels that go 0, 1, 2, 3, ..., 254, 255, we would restrict them to the values 0, 2, 4, 6, ..., 254 and then use the bit that signals odd or even to carry a message.

It's unlikely that, in a picture with lots of variation (or noise), the human eye would be able to pick out a pixel whose blue level had changed from 01010100 to 01010101 or vice versa. The table on the following page shows the basic process, just using blue pixels (so, the red and green channels are 0). (Note: it's very unlikely you'll see any differences in the blue hue for each of the 8 pixels in the table.)

Although the colours were correct when I drew the image and had the values shown, the printing process converts them from RGB to CMYK and the printer inks then approximates those values. Any slight colour variation will be altered by this printing process).

Just using the least significant bits of the colour information then, we could encode a byte every three pixels (with a bit left over). Since an image of size, say, 300 x 300 has 90,000 pixels (as 270,000 bytes), this means that we could, in theory, encode a message of around 30,000 bytes in such an image, just using the least significant bits of the colour information.

An old technique that's no longer used (because it's so obvious) occurs with the GIF format. The GIF format is a bitmap image, where the pixels can only take on one of 256 different values. These values are not colours, per se, but indexes into a 256 element table at the start of the GIF file, with each element defining a different colour. Here the steganography technique goes like this: create a colour table where all the

SECRETS IN PRINT

Modern printers, especially colour laser printers, use steganography to identify the printer and its serial number, and add date/time stamps on every page that's printed. In essence the printer will add a set of tiny light yellow dots holding this information (known as tracking dots) to each page, which are only really discernible under magnification.

The main reason for such steganography is an effort to track down and identify currency counterfeiters. Colour laser printers are the best tool to counterfeit bank notes since they can produce the most high-resolution copies with the highest fidelity colours. The tracking dots thereby give the authorities a better chance of finding the printer, and hopefully the perpetrators.

Of course, the printer will print the tracking dots on any single page, so, in theory, any owner can be tracked just as easily.

elements are black (say), and then just tack on the payload on the end. To anyone viewing this GIF file in an image viewer, it would just look like a black rectangle. Of course, once you're tuned to this particular technique, it's a pretty worthless way of communicating covertly.

CARTOON COMMS

Another way of using the same system, though, is to use a simple drawing or cartoon as the basic image. Here there are only two colours in theory – white and black – with white as the background. So we encode the payload in the background of the image, setting all the index values used as white in the colour table. The problem is that GIF images are compressed using the lossless

LZ77 algorithm and simple drawings would compress extremely well. Hence a stego file would have a much larger than expected size, triggering suspicion and a possible investigation into the secret message.

For an image stored in the JPEG format, we have another problem to deal with. The JPEG format for images is compressed with a lossy algorithm: in a very specific, controlled manner the algorithm 'averages' pixel information in blocks of 8 x 8 using frequency analysis in order to reduce the data needed to store it. (Another way of putting it is that the highest frequency information, changes in which we're less likely to not notice, is 'smeared'.)

That means that for JPEG images as a carrier we have more work to do. Just decompressing the image into a bitmap, modifying the bitmap then recompressing the image into the JPEG format is going to destroy the payload. That's why several JPEG steganography programs merely tack the payload as a special JPEG metadata header (or, worse, as an EXIF data value) onto the file. Others will create a PNG file instead (they essentially decompress the image into a bitmap, alter the bitmap as discussed above, and then save the package as a PNG file using lossless compression).

WORDS IN JPEGs

The better steganography programs that support JPEGs work in a different manner. No longer do they alter the individual pixels of the image, but instead modify the quantised DCT coefficients.

The way it works is this: the RGB pixel values are converted to the YCbCr colour space – the Y part is the luminance, which contains all the real detail, the Cb and Cr values contain the colour information. 8x8 pixel blocks for each of the axes are converted using a DCT (Discrete Cosine Transform) into frequencies.

The matrix for the transformed values is very skewed to the top left-hand corner, the lower frequencies, and this matrix is then quantised by dividing with a standard quantization matrix. It's this matrix that defines the quality level of a JPEG image – the resulting matrix is even more skewed to the top left (most of the bottom right is zero) and is easily compressed.

The better JPEG steganography programs will modify the least significant bits of the quantised DCT coefficients to encode the payload (and only if those quantised coefficients are not zero or one).

Since the purpose of steganography is to hide a payload inside the carrier in such a way that only the recipient knows it's there, we should pay attention to how someone else (let's call them an analyst,

since the field of study is known as steganalysis) might detect that a carrier image has been modified to include a payload. The first point to make is the obvious one – if the analyst is able to get the original image, then all bets are off. Clearly they can determine what, if anything, has been changed.

HUNTING SECRETS

The next instrument in the analyst's armory is statistics. If the analyst is able to determine which digital camera was used, that is, the brand and model, they can collect a range of unmodified images from that camera. The analyst can then investigate those images for statistical 'signatures' that apply to all images from that camera. For example, the implementation of the JPEG compression algorithm in that particular camera may have certain idiosyncrasies that can be agglomerated as a signature. If another image taken by the same camera has a slightly different signature, it would indicate the image file has been modified.

Another point of attack is the visual artefacts produced by the JPEG algorithm. If an image has statistically different artefacts, the conclusion, again, points to an image that has been modified in some way, perhaps by using an unsophisticated steganography algorithm.

JPEG steganography suffers from another visible footprint – since we're

LOSSY COMPRESSION

As discussed in the article, it's harder to embed a payload in a file format that's lossy compressed (that is, certain information is removed or averaged for the compressed file) than in one that is not lossy compressed. The JPEG image format was the prime example of this in the main text.

Other lossy file formats are MP3 for audio tracks and the various standard video formats (MPEG, SWF and so on) and using these for steganography is a much harder proposition. That's why many simple tools inject the payload into the carrier under a special (and ignored) header in the metadata in the carrier, rather than encoding it.

If an audio file or video are to be used, then the non-lossy formats are preferred (WAV and AVI files) since it's easier to make changes that will survive the compression step. That's not to say that there aren't techniques such as frequency manipulation that won't survive the lossy compression, it just becomes easier to detect statistically.

pixels color values

■	=	10100100
■	=	10110111
■	=	10100110
■	=	10100110
■	=	10101010
■	=	10110010
■	=	10101110
■	=	10111111

01000001='A'

Simple steganography with blue pixels encoding the letter A.

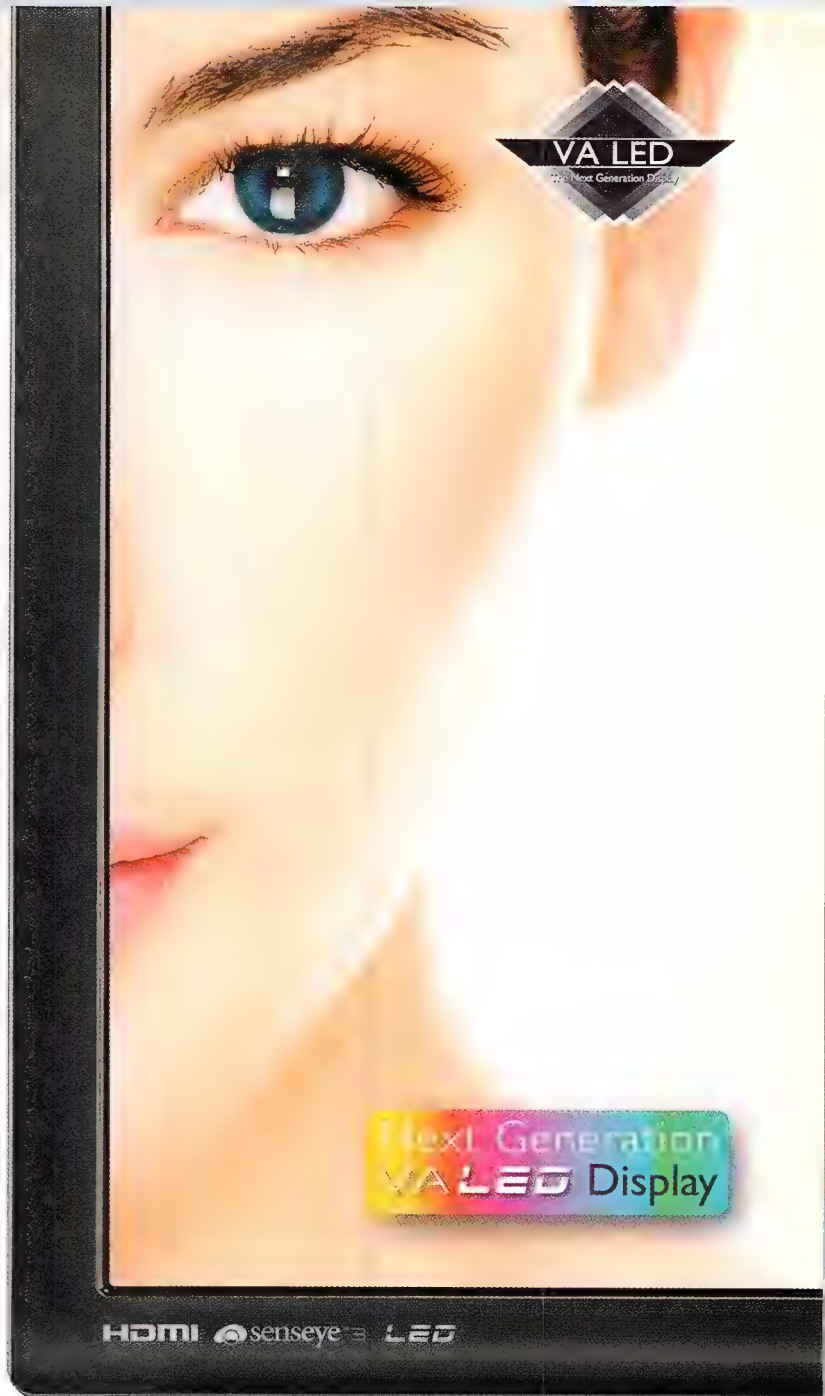
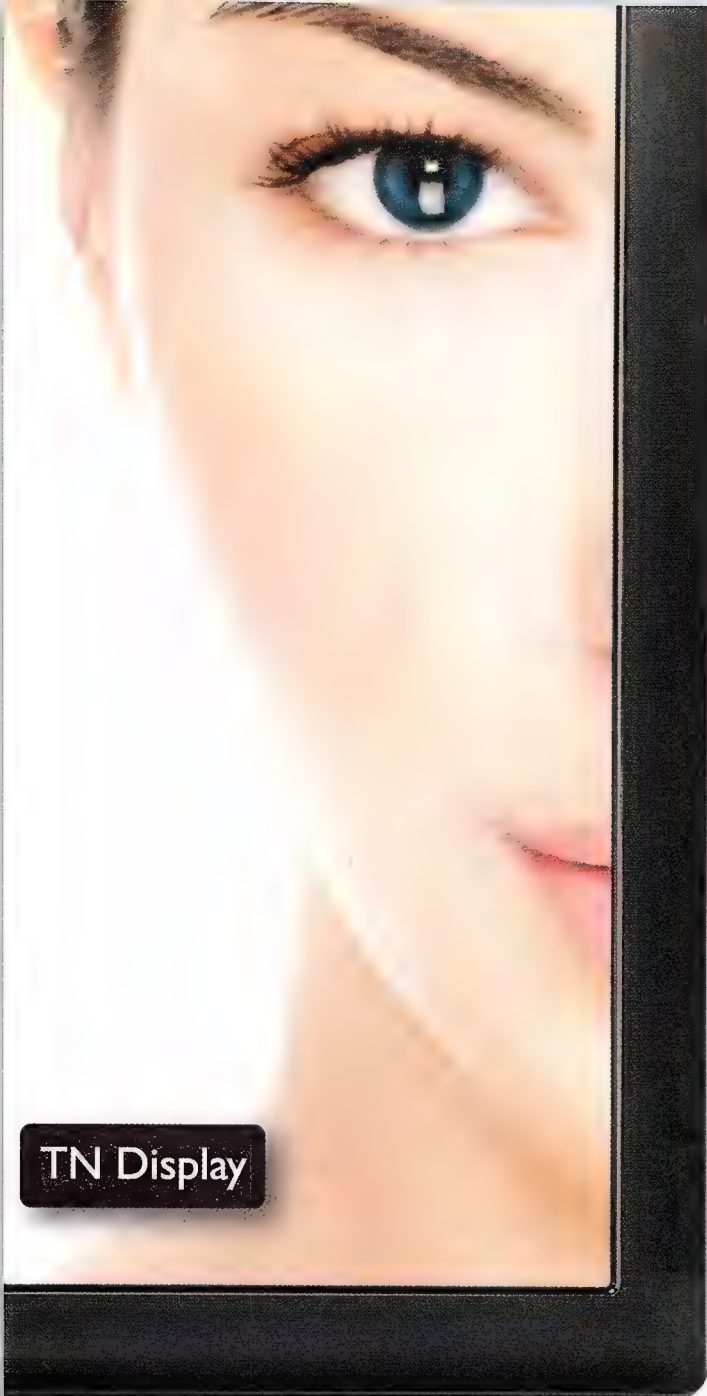
encoding the payload in the quantised data, it will have a different signature than most of the normal quantised data blocks. In particular, normal quantised data tends to be very compressible (the whole point of the 'divide by the quantization matrix' part of the JPEG algorithm is to make it so), but payload-encoded quantization data is not that compressible at all. Hence the file size grows and there's a visible effect in the data.

ADVANCED ANALYSIS

More advanced techniques attempt to discover a payload by analysing the statistical variability of the least significant bits, since many steganography algorithms work by encoding the payload in those bits. Another technique is to recognise that many programs will hide the payload in the beginning of the carrier file (in essence, the algorithm will blend the payload starting at the beginning of the carrier until it's completely merged), so the statistical properties of the last part of the file will be different than that at the start.

The popular steganography algorithms (those that are in mainstream use) leave trails that can generally be quite easily detected. Hence, since steganography is essentially an obfuscation technique, the algorithm used tends to be hand-crafted and kept a secret as well. An example of such an obfuscated algorithm is this: create a linear congruential random number generator (RNG) that outputs (say) numbers between 1 and 10. The output of this RNG defines the next pixel to alter in an image to encode the payload. What's happening is that you're spreading out the effects of the changes less intrusively and more widely. The payload size is reduced, yes, but its trail is very diffuse and harder to detect, and you need the exact same RNG with the exact same starting conditions to be able to extract the payload.

All in all, steganography is a fascinating topic of study. You can, with very little effort, produce your own working steganography algorithm that's hard to detect and therefore secret. [BUC](#)



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BOOT, INTERRUPTED

In our ongoing series about Microsoft's new OS, [Ashton Mills](#) explains how Windows 8 reinvents the boot process.

Microsoft says it has a problem. A *good* problem perchance, but a problem nonetheless. You see, according to Microsoft, Windows 8 boots fast. So fast, in fact, that certain functionality PC users are used to – specifically being able to interrupt booting to enter the BIOS, or bring up the Windows recovery menu – are kind of hard to do now. Before your finger has pushed the button, it's already too late.

It certainly is nice that Windows 8 will boot faster than its predecessors. There's nothing as frustrating as your own time wasted sitting in front of a screen at home or at work while you wait for a PC to boot, it could arguably add up to months or years of wasted time.

But what of the functionality traditionally held post-POST (Power-On Self-Test – the end sequence of all hardware initialisation before software is loaded)?

Microsoft has a plan.

INTERRUPTING IS IMPORTANT

You could argue that interrupting boot shouldn't be necessary, and for the majority of users it normally isn't. But just because it's rarely used doesn't mean it deserves being neglected – there are many reasons for interrupting boot, including BIOS access (for example to change boot order), repair or recover a drive, or simply to boot Windows in a 'safe' mode where hardware compatibility is at its maximum.

The problem is compounded, of course, with the advent of SSDs, which are insanely fast for random access, which just happens to be the majority of work not only in general usage, but in booting an OS, too.

Between changes in Windows 8 and SSDs, the OS can boot in a matter of seconds, and while the POST stage will remain the same for a particular hardware product, once control is handed over to the Windows 8 boot manager it'll be pot luck whether your keystrokes – such as the classic F8 to bring up advanced boot options – are registered in time before the OS boots proper.

According to Microsoft, paired with one of the new UEFIs and an

SSD, the window to interrupt Windows 8 from booting is less than 200ms. Which is to say, good luck hitting that!

And frankly, how silly is it that we even have to play chase the tail with a PC just to get into advanced boot options? I'm sure I'm not the only one who's familiar with the rapid repetitive keystroke slam dunk that is trying to enter a BIOS or Windows boot menu. Surely there's a better way?

DEFINING THE PROBLEM

So Microsoft has analysed the feedback of users, developers and testers to determine the most common scenarios for interrupting boot and how to manage these with Windows 8. The key findings were:

- **Being able to boot** from another source, such as a USB key (handy, as it happens, for installing Windows or Linux images) or to simply enter the BIOS to change system settings. Currently this is often done via the hardware's BIOS (hitting DEL, F2 or F12 to enter the BIOS or access an alternate firmware-based boot menu).
- **Troubleshooting a problem** or undoing the most recent change in Windows, such as going back to a restore point using System Restore, or via the command prompt for more advanced users. In Windows versions prior to Windows 8, this is enabled by hitting F8 during boot – if you're quick enough.
- **Issues that arise** after the core of Windows has booted, such as problem drivers, which could cause the OS to crash before being able to log in and execute a fix.
- **Developers needing** to disable certain Windows features in the course of testing, such as driver signing and runtime automated services.

True to form with the design philosophy of Windows 8, Microsoft decided that although there are different reasons and sometimes different methods to interrupt boot, and traditionally doing so presented users with plain ASCII-based menus for choosing options, with Windows 8 all of these should be accessible by the same boot-time menu and reflect the look and feel of Windows 8 – as well as be touch-enabled for devices that support touch.

Choose an option



Continue
Exit and continue to Windows 8
Consumer Preview



Troubleshoot
Refresh or reset your PC, or use
advanced tools



Use a device
Use a USB drive, network connection, or
Windows recovery DVD



Turn off your PC



**Use another operating
system**
Continue with another installed version
of Windows

The new Windows 8 boot menu mirrors the look and feel of Metro and provides new functionality like booting from a USB device.

Advanced options



System Restore
Use a restore point recorded on your
PC to restore Windows



Command Prompt
Use the Command Prompt for
advanced troubleshooting



**System Image
Recovery**
Recover Windows using a specific
system image file



**UEFI Firmware
Settings**
Change settings in your PC's UEFI
firmware



Automatic Repair
Fix problems that keep Windows from
loading



**Windows Startup
Settings**
Change startup behaviors such as
fast startup and secure boot enforcement

For UEFI-based machines, Windows 8 will provide a menu for changing some firmware settings directly from the boot menu.

THE SOLUTION

First and foremost, Microsoft integrated all these functions into a single boot-time menu, which you may have already seen if you've been playing with the Windows 8 Consumer Preview or Release Preview. This provides a consistent experience, regardless of what you need to do when interrupting a Windows 8 boot.

Secondly, the need to play slam the keyboard in order to access it is no longer required. Instead, entering the menu is possible through one of two ways:

- **If there's a problem** preventing Windows 8 from booting that Windows can detect, it will automatically enter its new recovery options menu.
- **In the case** that Windows is working perfectly but you need to access the menu, rather than rely on an interrupt-driven approach, you can intentionally choose to boot to the menu at your next reboot.

And just for variety (well, and some necessity) there are three ways to do the latter.

TRIGGERING THE NEW BOOT MENU

The primary method for doing so, and which Microsoft expects most users will make use of, is via the 'General' tab of the 'PC settings' options, which can be accessed via the 'Settings' charm or searching from the Start Screen.

Importantly, this doesn't leave you in the lurch about what you want to do – by default (as the presented options

may differ on different hardware platforms) – you're given the option to 'Refresh your PC without affecting your files', aka clean-install without nuking your data, 'Reset your PC and start over', which is to say nuke your PC in entirety or 'Advanced startup', which will launch you into the new boot menu (and from which the first two options can also be executed).

But here's where Microsoft has implemented a little magic – selecting the Advanced startup doesn't actually reboot your PC just yet. Instead, Windows 8 is shut down and just before the point where it would normally initiate a hard boot, the new boot menu is displayed instead – this way, if you choose an option that requires you to reboot, you're only rebooting and going through the PC's (sometimes slow) POST process once, rather than twice.

As it may sometimes be required to enter the new boot menu without being logged in as a user – useful in IT support or you're helping out on someone else's machine – it can also be triggered by simply holding down the Shift key while clicking 'Restart' from the 'Shutdown' menu, wherever it may be found (for example in the 'Lock' screen, but also under the 'Settings' pane from the 'Settings' charm while logged in).

Finally, for consistency with previous Windows versions and for command-line junkies, it can also be triggered from the command line, using `shutdown /r /o`. The new `/o` flag tells Windows 8 to trigger the new boot options menu, and requires the `/r` flag for restarting.

Start





Windows Startup Settings

Restart to change Windows options such as:

- Disable driver signature enforcement
- Disable early-launch anti-malware protection
- Disable automatic restart on system failure
- Enable low-resolution video mode
- Enable debugging mode
- Enable boot logging
- Enable Safe Mode

Restart

The classic F8 boot menu is still present in Windows 8, accessible through the Windows 'Startup Settings' dialog.

Start

PC settings

Activate Windows

Personalize

Users

Notifications

Search

Share

General

Privacy

Devices

Wireless

Ease of Access

On

Language

Add or change input methods, keyboard layouts, and languages.
Go to Language in Control Panel

Refresh your PC without affecting your files

If your PC isn't running well, you can refresh it without losing your photos, music, videos, and other personal files.

Get started

Reset your PC and start over

If you want to recycle your PC or start over with it, you can reset it and remove everything.

Get started

Advanced startup

Start up from a device or disc (such as a USB drive or DVD), give startup settings, or restore Windows from a system image

Restart now

The new boot menu can be launched from Windows 8's settings under 'General', and doesn't require the PC to reboot to use it.

AIMING FOR CONSISTENCY

The menu itself is designed to be a one-stop shop for any boot-related task. This means it doesn't just provide access to features like clean-installing or repairing Windows, but also to functions like reverting to a previous state using 'System Restore', or gaining deeper access through the command line.

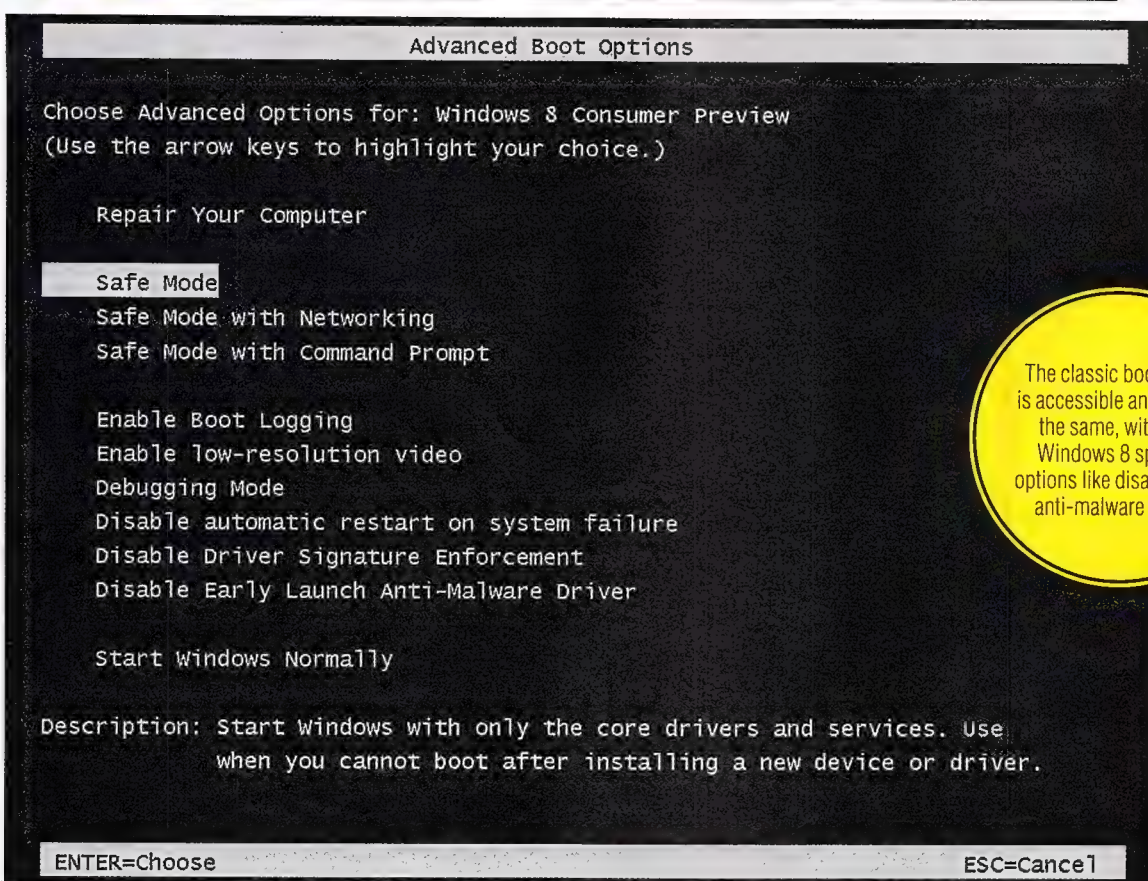
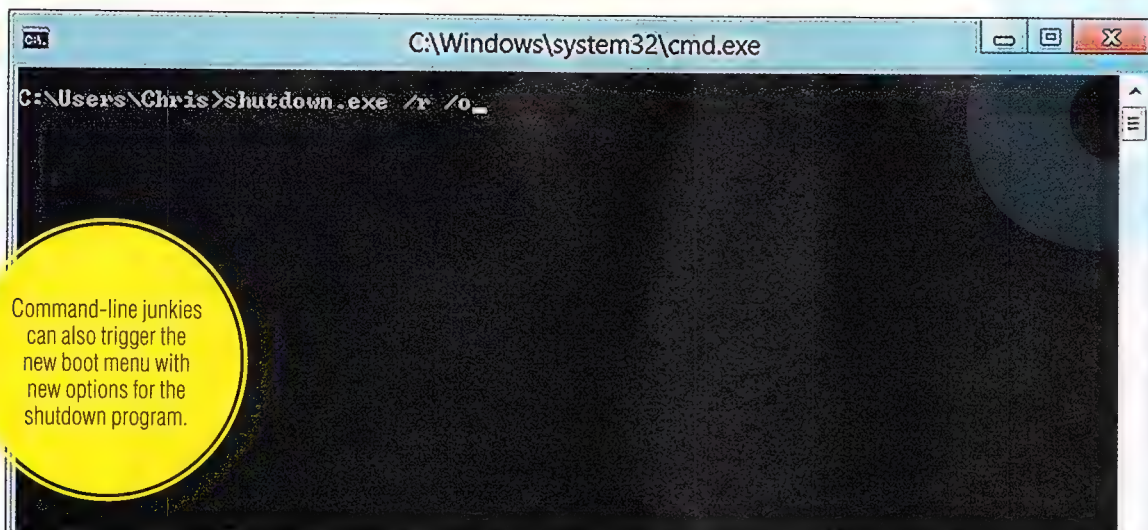
Importantly it allows you to boot other operating systems, too, and so functions like a boot manager. This makes it much easier to boot from another partition containing another Windows boot, Linux or some other OS. If the machine is UEFI-based, you can also directly boot from removable media like a USB key. This is a great step forward, as it negates the need to enter a PC's BIOS at all if you need to use a bootable USB to install or repair an OS.

Similarly, for those times you *do* want to enter the BIOS to change settings, Windows 8 has an option to reboot directly into it – but only for UEFI-based systems (as it's

not possible to do this with the traditional BIOS). This again negates the need to try and play keyboard games hitting Delete or F2 fast enough to enter the BIOS at a system reboot. Now you can just tell Windows 8 to restart into it and sit back and relax. This isn't just a nice-to-have feature, it's all-but essential, given the fast initialisation of UEFI systems that pass boot directly to Windows 8 rapidly. You'd have to be very quick indeed to interrupt the process to enter the UEFI firmware without the help of the new Windows 8 boot menu (UEFI can POST in two seconds or less).

Finally, depending on the hardware, other options may appear, like UEFI settings for UEFI-based machines (which all PCs will eventually be as UEFI replaces the aging BIOS).

What about safe mode, the staple go-to when things just fail and you need Windows to boot without drivers and any other fluff? It's still there, buried under the developer-focused options. And interestingly, this is the one time you



can break rank from the new Windows 8 boot menu functionality. Selecting the new 'Windows Startup Settings' option now reboots the PC into the classic Windows boot-time menu you're familiar with if you press F8 during boot. This provides access to options like disabling driver signing, entering low-resolution mode, starting Windows without networking and Safe Mode. And in case you're wondering – no, there's no Metro in Safe Mode, you're presented with a classic Windows desktop (thankfully).

LOOKING TO THE FUTURE

It's good to see Microsoft tackling the boot process not only from the perspective of speed, but of the ability

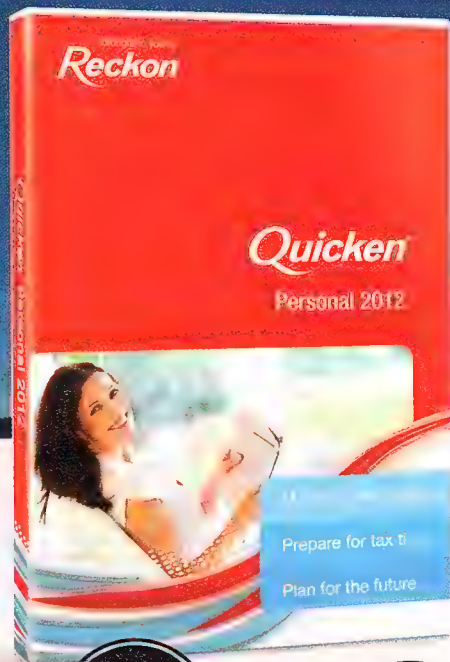
to interrupt it when required. The integration with UEFI is a first among PC operating systems and taking advantage of UEFI features means we can finally say goodbye to both the archaic BIOS and the associated boot-time menus we've been dealing with for decades.

It will be interesting to see how well Linux operating systems take advantage of UEFI features to do similar things with boot, but in the meantime, the Windows 8 boot menu will make it easier to debug, repair, boot external media and launch alternative operating systems all without the keyboard mashing that's been a part of this process for so long. And this is something we're definitely looking forward to! [BMC](#)



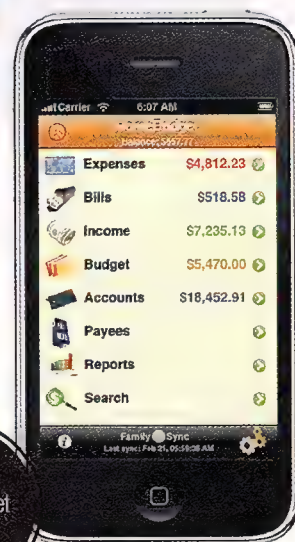
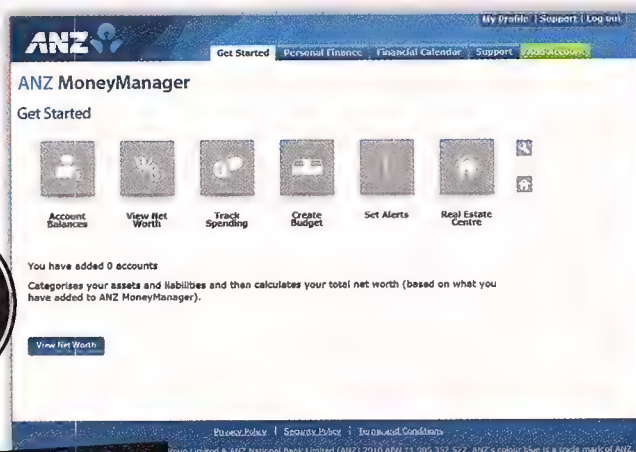
MONEY

The start of the new financial year is the perfect time to whip your finances into shape. Our money management expert **Kurt Best** reveals his picks, from PC programs to online options.



Quicken
Personal
2012

ANZ
MoneyManager



HomeBudget

PERSONAL FINANCE OPTIONS

Got a grip on your finances – where the money comes from and more importantly, where it goes? This month, we've taken a look at three different yet very effective alternatives to taking some control over your financial situation.

QUICKEN PERSONAL 2012

Price: Personal, \$99; Personal Plus, \$219;

Home & Business, \$489

Web: www.quicken.com.au

9
10

For a more traditional and feature-rich approach to managing your money, there's Quicken Personal. This easy-to-install package covers every conceivable angle of personal finance, from bank accounts to loans, property, shares and more. If you own it or owe it, then Quicken Personal can track it. There's so much to this package that the average user is likely to only ever use a portion of the features. With a price tag of between \$99 and \$489 (for a small business version), you need to be sure you're going to get value from this product.

ANZ MONEYMANAGER

Price: Free

Web: www.anz.com/anz-moneymanager

8
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MoneyManager from ANZ makes good use of online cloud-based technology. The browser-based package utilises your internet banking credentials to update your banking data so you don't have to manually enter transactions or import data. This is especially smart if you have accounts with different banks, as you can see all your finances in one place. You don't have to be an ANZ customer and the signup is free to start tracking your accounts or use the budgeting tools. It can't do everything that Quicken Personal can do, but it will give you the short story and tell you if you're in the red or the black.

MOBILE OPTION:

HOME BUDGET

Price: Free

Web: anishusite.appspot.com

7
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In the land of smartphone apps, there are plenty of options emerging to help track and manage finances. iOS users should check out HomeBudget, which is offered free in its lite version or \$5.49 for the full version. It's great for recording spending as you go in just a few simple steps. The other impressive feature is the ability to share a budget with other users, which is aimed at families. The lite version allows 10 expense and five income transactions per month, so most people will end up paying to remove this limitation.

MAKERS



BUSINESS FINANCES GO ONLINE

PERSONAL FINANCE CONCLUSION:

These very different offerings all attempt to deliver the same result: financial management. So which should you go for? Quicken Personal gives the most complete solution, but is comparatively pricey and could be tricky for the financially challenged. HomeBudget is convenient and has a surprising twist in the family sync feature, but it does only deliver a limited view of your financial situation. ANZ MoneyManager is an exciting concept with daily automatic data feeds from wherever you have your money deposited and really simple yet solid reporting tools. If you currently do nothing towards managing your finances except hope for the best, then ANZ MoneyManager is a definite step in the right direction.

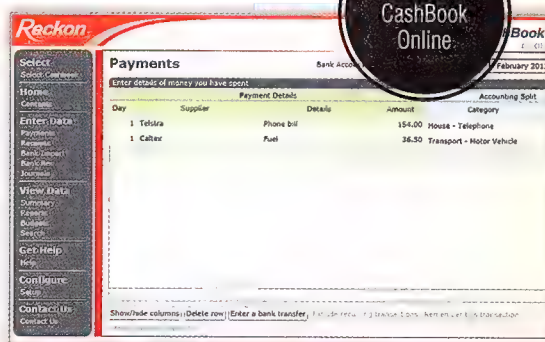
Managing a business isn't easy. The current economy presents challenges that demand attention. SMB operators are time poor, need key performance information at their fingertips and are ruthlessly cutting costs. As a result, accounting software is evolving, as new features focus on common themes: online access, data automation and subscription models. If you're a time poor, information-hungry business owner, the question is: what answers does the latest accounting software have for you? Here's a quick summary of the three key trends.

● **Online delivery.** This trend isn't only occurring in accounting tools, but across the spectrum of business applications. Data security, maintenance and backup are the key advantages, but flexibility is also a major driver – you, your staff, your bookkeeper or accountant all need to be able to access data easily, both from within your business and remotely. With everything online, this can be done without data being backed up, copied or moved anywhere.

● **Data automation.** This goes hand in hand with the application environment. Because of the level of security and connectivity, data can be passed from one provider to another seamlessly. Reducing the data entry tasks through bank feeds and allocating it based on preset rules, automation saves a huge amount of 'doing the books' time.

● **Paying by the month.** In the short term, this option saves money, smooths out cashflow and ensures reliability in the way applications are maintained and work for you over time.

So that's online accounting – but where to start?



RECKON CASHBOOK ONLINE

Price: \$198 per year

Web: online.reckon.com.au

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If all you need is the basics, CashBook Online is a decent choice. This product aims at replacing the traditional cashbook with a simple structure of transaction recording and reporting. The online help uses great step-by-step videos to walk you through core functions; however, the absence of a keyword search is frustrating. CashBook Online also includes budgeting, GST reporting and automated data feeds from your bank. What you don't get is invoicing, accounts receivable or payable – this is a cashbook, pure and simple.

QUICKBOOKS ONLINE

Price: \$198 per year

Web: online.reckon.com.au

Still with Reckon, but a step up in functionality, is the hosted version of QuickBooks. It's the same application that can be purchased and installed on your PC, just delivered over the internet. If you've used QuickBooks before, you get a look and feel that will be very familiar. And if you already have a data file in use, you can easily upgrade to the online version. The downside is the lack of bank feed integration – every other solution reviewed here has the functionality to bring in data automatically from your bank and this is sadly lacking in QuickBooks.

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MYOB LIVEACCOUNTS

Price: \$25 per month

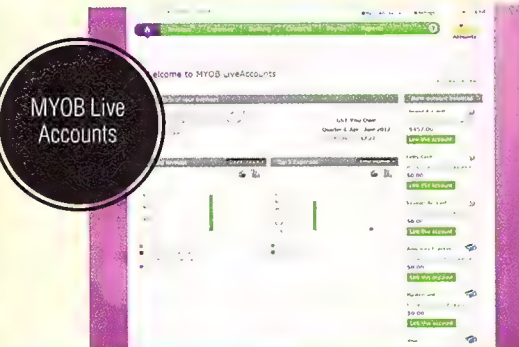
Web: liveaccounts.myob.com.au

Last year, MYOB LiveAccounts entered the online space, offering a comprehensive cashbook, invoicing and accounts receivable/payable service, and simple payroll module. It sits well in a browser, and the main dashboard offers a good amount of detail without being overwhelming. Unlimited access for \$25 per month is also a refreshing change from convoluted pricing models at play elsewhere. It would be nice to have a little more access to edit transactions and customise reports, but apart from some restrictions LiveAccounts is a comprehensive, consistent solution.

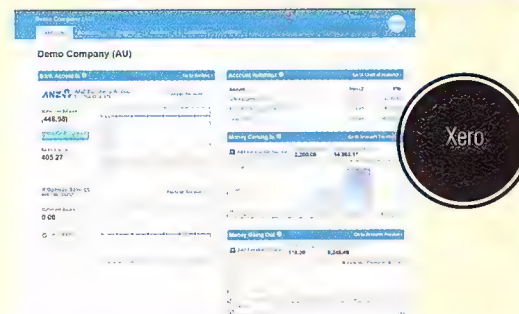
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QuickBooks Online



MYOB Live Accounts



Xero



Saasu

SAASU

Price: Free 30-day trial; XS, \$9 per month; S, \$20 per month; M, \$35 per month; L, \$60 per month

Web: www.saasu.com

Saasu has been around in this space for longer than any of the other products reviewed, which shows in the depth of features. The customisable dashboard, 'to-do' list and detail in transaction entry are all great. Reporting is a little disappointing, though, with the predefined options fairly limited, and navigating through the menu structure takes a little bit of time to become familiar. The starter \$9 per month offer is about as close to realistic as any of the low-cost entry points offered, and all the way along the price chain there's reasonable value on offer. There's also a cut-down smartphone-tuned interface that will work well for a business with a sales force that's out on the road and needs to record invoices as they go.

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XERO

Price: Small, \$29 per month; Medium, \$49 per month; Large, \$64 per month

Web: www.xero.com

One of the online stars of recent years has been Xero. It's similar to MYOB LiveAccounts, but delivers much more in terms of functionality, customisation and reporting tools. Recently adding a fully integrated payroll, Xero now delivers a serious alternative to the traditional PC-installed accounting packages. Xero has put quite a lot of work into developing a network of accountants and bookkeepers who will use and support users of Xero. This is a master stroke, as part of the key to automation lies in greater integration with third parties. Price and fit for purpose will be the main consideration for a small business, with the \$29 per month option too restrictive and \$49 per month a big step up for a business solution. **ABC**

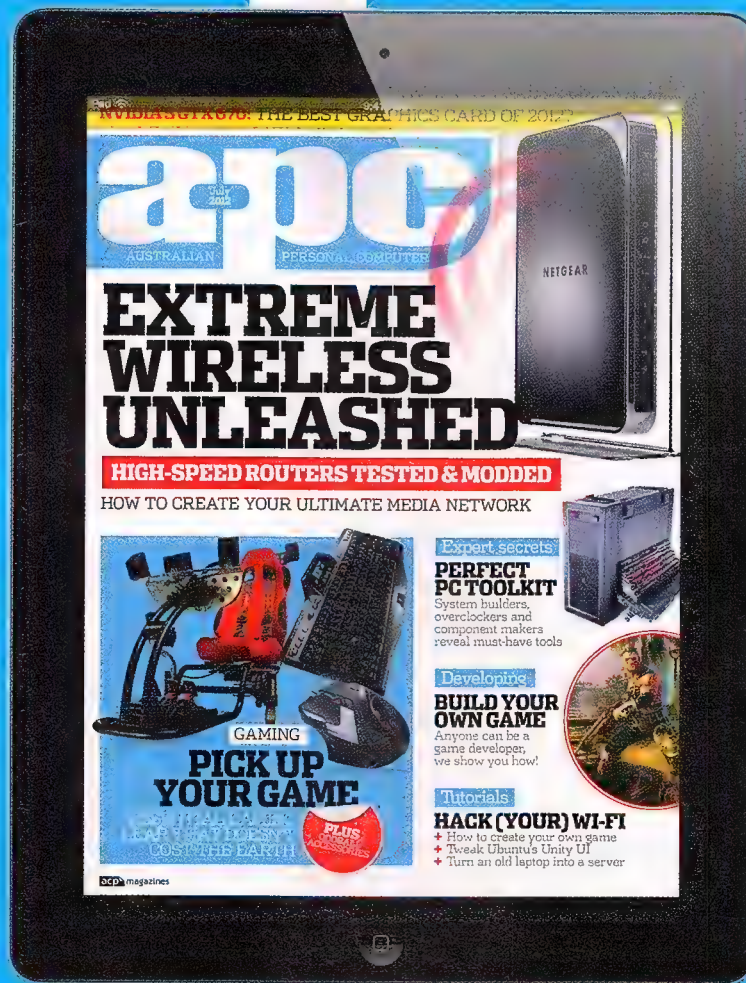
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BUSINESS FINANCES CONCLUSION:

So it comes down to a decision: for a microbusiness with visions to grow, Saasu is more affordable and realistic in terms of features and functionality, although it's not as informative and user-friendly as it could be. Xero is more expensive, but has better reporting tools and connectivity through advisor support channels. Xero inches ahead of the pack when it comes to taking full advantage of all the online accounting model has to offer, and it has a polished and easy-to-use format.



apc



On sale now for only \$5.49



Available on the
App Store

iPad is a trademark of Apple Inc., registered in the U.S. and other countries. App Store is a service mark of Apple Inc.



quicktips

HELP AND ADVICE

Experts solve your computing problems

APC and its readers can be one giant helpdesk. If you have a technical problem, chances are one of us can solve it.

SOFTWARE

CROSS-PLATFORM COMMUNICATION

Q Can you help me with this tricky file-sharing conundrum? I use a HP TX1200 laptop running Windows 7, my wife uses her first-generation iPad and my son has a tablet running Android. How do I get all these devices to talk to each other – do I need to buy something like the two-port FireWire adaptor I already use to plug in to my laptop when I access my camcorder?

Ian Burnell

A We're assuming you want to swap files with each other. If this is the case, you should look into some kind of file-syncing solution that comes with

Android and iOS mobile apps that will allow your wife and son access from their tablets. Two solutions stand out – SugarSync (www.sugarsync.com) and Dropbox (www.dropbox.com). Both offer free storage – 5GB and 2GB respectively – and provide free tools for your laptop and your family's tablets. They're simple to set up, and file sharing is quick and easy.

SECURITY

SQUARE BLOCK ON SCREEN

Q After experiencing a 'blue screen of death' on my HP Pavilion, which is running Windows Vista 64-bit, I rebooted as I've done when it's happened before, but this time I was confronted by

a white square in the middle of my screen. I've tried rebooting, System Restore and testing all my programs, and I'm no closer to finding out what it is. Can you help?

Stan Sellers

A This problem is usually associated with a third-party program or process that's set to start with Windows, so we asked Stan to install HijackThis! and then send us the log of what was starting up on his computer.

The log we received was incredibly long, indicating that a large number of programs were running on his system at startup. We noticed, however, that there were also some suspicious-looking entries among the results, including the MyWebSearch toolbar.

We asked Stan to download and install

GET MORE THAN FOUR HARD DRIVE PARTITIONS

Q I want to repartition my hard drive so it has a Windows and a data partition, but Computer Management tells me I already have four partitions set up. How can I work around this?

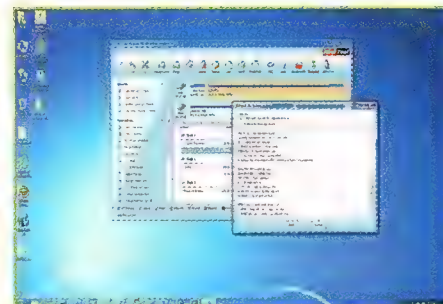
Les Green

A After backing up your drive using Macrium Reflect Free from (tinyurl.com/3zphz46), follow the step-by-step guide on the right to convert your Windows primary partition to an extended partition, which can be split in two.



01 BACK UP, INSTALL FREE SOFTWARE

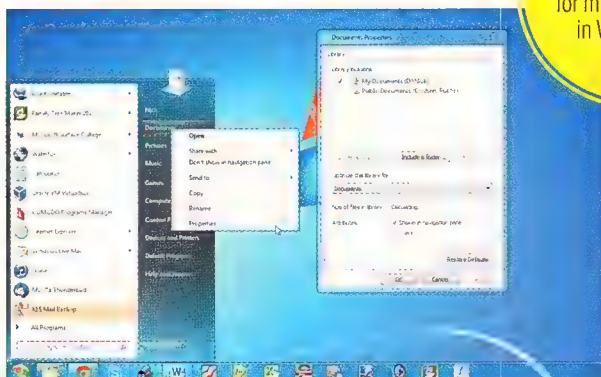
Install Partition Wizard Home Edition (tinyurl.com/bnzfaa9). Verify that a small 100MB reserved partition is on the drive. If so, right-click drive 'C:' and select 'Check File System'.



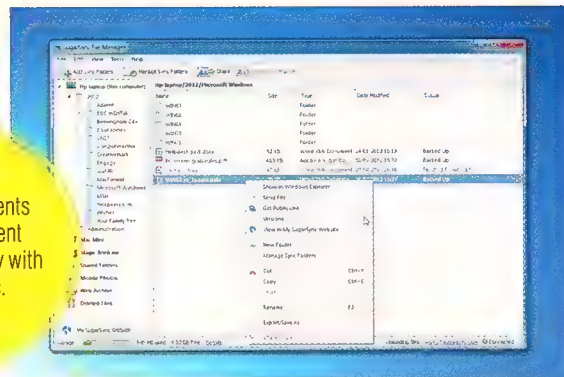
02 VERIFY DRIVE CONTENTS

The drive must be free of errors, so click 'Start' to run a disk check. If errors are found, repeat the process, selecting 'Check and fix detected errors' before clicking 'Start'.

Check the Documents Library for missing folders in Windows 7.



Share documents across different platforms easily with SugarSync.



A Initially, we were at cross purposes with Peter – until he provided more detail about his particular problem – namely that he couldn't find his files when he was using the 'Start > Documents' shortcut. That's because the Documents shortcut on the Start menu doesn't point to your actual Documents folder, but the Documents Library. By default this library includes your Documents folder, so to all intents and purposes it's the same, but if you fiddle around with the settings – as Peter had done – you can appear to lose the folder.

The simplest solution to this missing folder problem is to click 'Start', then right-click 'Documents' and select 'Properties'. Click 'Include a folder...', then browse to your personal user folder to select your 'Documents' folder if it's not already present and click 'Include Folder'. When you click 'OK', you should find that the folder is visible again in Documents.

INTERNET

FORWARDING IMAGES

Q Thank you for putting me right on forwarding images through attachments. This has brought up another problem. I don't like forwarding mail with other people's info on it. Can I delete it and still forward images and text?

Harold Tokins

A Unfortunately, you're not able to edit an email before forwarding it as an attachment. If this is a deal-breaker, you'll need to consider an alternative email

program that doesn't have the problem with forwarding on images in emails in the first place. Ironically, Windows Live Mail 2009 doesn't have this problem, so you could revert to that by removing Windows Live Mail 2011 and downloading and installing that from tinyurl.com/7h5djw9. It should work with your existing mailboxes, but to be sure, we recommend backing up your email first using a free tool, such as KLS Mail Backup.

Another alternative solution would be to switch to a different mail program, such as Microsoft Outlook or Mozilla Thunderbird (www.getthunderbird.com), but you'd have to jump through several hoops to import

your Windows Live Mail messages into Thunderbird, which could prove prohibitive.

WINDOWS

MOVE TEMP FOLDERS

Q I have Windows installed on a small 30GB solid-state drive, and I'm a big fan of flight simulators, which are large and won't fit on the drive. I've been able to install a couple on to my D drive by choosing a custom installation and manually selecting my D drive, but I'm unable to do the same with Real Environment Xtreme 2 for Microsoft Flight Simulator. Can you help me with this problem, please?

Eric Danes

A The problem you're facing isn't with the program refusing to install to drive D, but the fact that it requires 25GB of free space during installation for its temporary files, which are unpacked to the TEMP folders that – by default – reside on drive C. The solution to this issue is to move these TEMP folders to drive D, which will also help with future program installations.

Click 'Start', right-click 'My Computer' or 'Computer' and choose 'Properties'. Switch to the 'Advanced' tab (Windows XP) or click 'Advanced system settings' (Windows 7 and Windows Vista), then click the 'Environment Variables' button. Select 'TEMP' and 'TMP' in turn, click 'Edit' and type D:\TEMP and D:\TMP for each entry respectively. Click 'OK' twice, create both folders on your D drive (TEMP may already be present) and you should be able to install the program. bit.ly

TECH GLOSSARY

DONGLE. A term used to describe a small USB device such as a TV card, Bluetooth transmitter or Wi-Fi stick, for example.

COLOUR PROFILE. A file used to calibrate the colour settings of a specific hardware device, such as a monitor, a scanner or a printer for standardisation.

ENVIRONMENT VARIABLE. A value that acts as a shortcut to the system folder path.

EXTENDED PARTITION. A non-bootable partition type that can be split into further logical partitions or drives.

TRUSTEER RAPPORT. This is a program that's designed to provide security protection while you're logged onto online financial institutions.

CONTACT@APCTEST.COM

Share your tech tips

Have you solved a tech problem or found a better way of doing things with your computer? Share your information with other APC readers by sending it in as a tip to contact@apctest.com, together with your name and contact details (details won't be printed). Alternatively, if you have a technical question post it online on our forums at apcmag.com/forums and other readers may be able to solve it.

EXPERT ADVICE IN YOUR POCKET

INDEPENDENT REVIEWS
FROM THE GEEKS ON THE
LATEST LAPTOPS, TABLETS
AND NETBOOKS.

Notebook Hunter is on your mobile. We'll even tell you how to get the best deals and what to ask when shopping around. Each item is individually assessed by the trusted geeks at APC magazine. Providing information on the go so you can buy smarter.

Scan with
your mobile
phone to visit
Notebook
Hunter's
mobile site.



Powered by

VISIT: **M.NOTEBOOKHUNTER.COM.AU**

WINDOWS

Watching the watchers

Did you know that personal information is collected every time you surf the web? Here's how to stay safe.

APC EXPERT

ASHTON KALES

Ashton has been testing OSs since Slackware came on floppies. Before this he was one of the few who used OS/2 (and loved it) and before that, he remembers installing Windows 3.1 NT from 22 floppy disks. His idea of fun is to spend a weekend compiling the latest Linux kernel or testing out the latest Windows beta.

In a recent TED talk by Gary Kovacs, CEO of Mozilla, he introduced a new plug-in called Collusion that allows you to see – at a glance – just how much information is being gleaned from you, without your permission, when you surf the web.

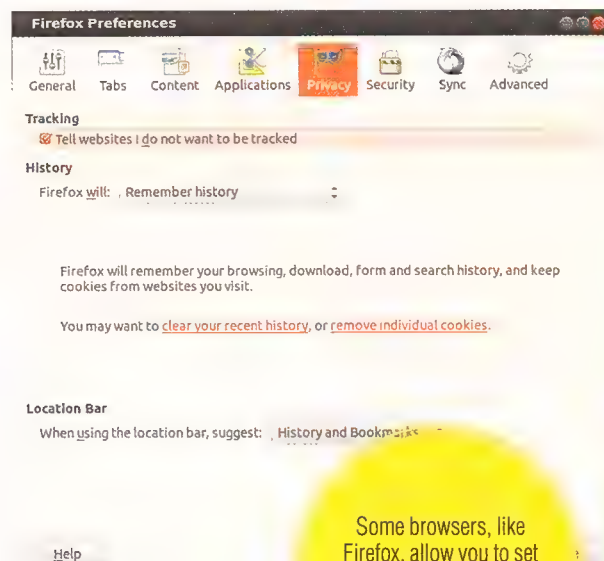
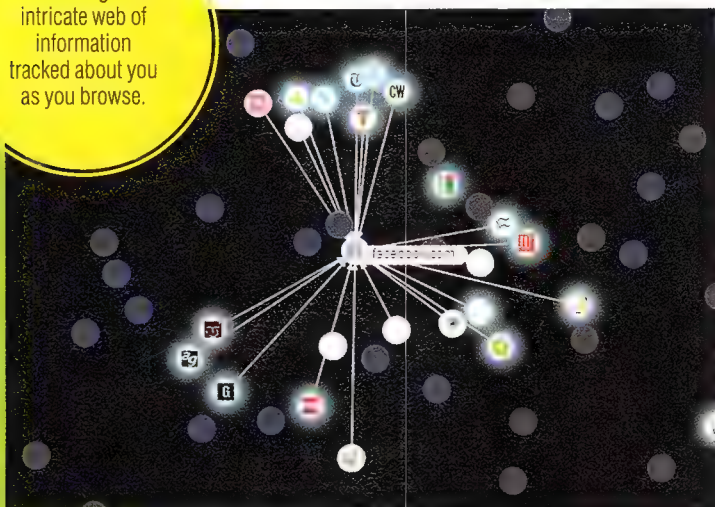
As knowledge really is power, the fact that data is collected about users should come as no surprise. Sometimes the information is used for targeted advertising, and that's fine – if you chose to allow it. But, as Collusion shows, visiting a site can set off a range of other sites you *haven't* visited that start storing information about where you've been, what you've viewed and more. And, as Kovacs explains in his talk, tracking and collecting data on you, me, and everyone else is a multibillion dollar business.

So what can you do about it? You can't necessarily stop it completely, but it can help if you're simply aware that when you browse the internet – even if you're using 'safe' modes like Chrome's Incognito – that you leave a trail that sites make it their business to follow. To see Kovacs' talk, head to tinyurl.com/bp37rl8. For now, here's a brief rundown on Collusion and what you can do to try and keep your data private.

COLLUSION

Currently Collusion is a Firefox-only plug-in, so if you use IE or Chrome you'll need to fire up Firefox to give it a go. To install Collusion, head to www.mozilla.org/en-US/collusion.

Revealing the intricate web of information tracked about you as you browse.



Some browsers, like Firefox, allow you to set 'Do not track', though web sites don't have to honour it.

Once that's installed, restart Firefox and do what you normally do. Later, click on the small Collusion icon in the bottom-right of the Firefox browser to see a dynamic map of the sites you visited, as well as those you didn't and where information has been stored about your visit.

Sites with a halo are the ones you *chose* to visit. You'll often notice ancillary sites connected to them that were informed of your visit and where this data is being sent. One site can connect to many others, and they may then further share information about you with other sites.

All in all, it's a very eye-opening view of the sort of trail you leave just by browsing the web. Even if you don't submit any personal information and just click links as you browse, sites are building a profile of your movements, the things you like and anything else that your activities indicate.

PREVENTING BEING TRACKED

This isn't necessarily easy. Some browsers, like Firefox and IE (but not, unfortunately, Chrome) have a setting along the lines of 'Tell web sites I do not want to be tracked'. This sets a flag in the HTTP header that tells

TRACKING SITES BUILD PROFILES BY COLLECTING DATA OVER TIME

a site not to store information about your visit. Unfortunately, however, this doesn't mean much – a site has to honour it for it to be effective, and almost every site you visit won't be aware of the setting, let alone care to honour it. However, this doesn't mean you have no control at all. Tracking sites build profiles of you by collating data over time, and this is done through the use of cookies.

Cookies are tools used by web sites to store information about your visit, and they're usually quite helpful: cookies can remember which threads you've read on a forum so you can easily see new posts next time you visit; they're used to identify you when you're logged into a web site so you can, for example, purchase products online; some text fields such as username logins can be auto-populated via cookies; and they're often used to store personalised web site preferences you choose (such as how many search results to return per page with Google, for example).

The fact that they can be used to track you is more an abuse of the privilege than the technology itself. Still, as your browser stores cookies you do have some control over how they're used. Most browsers allow you to clear individual cookies from web

sites, or wipe all of your cookies, along with other personalised data in your browser, such as browsing history. Doing this, however, is like throwing the baby out with the bath water, as nuking all your cookies will also clear all the information you might want stored and find useful, such as web site preferences.

Hence look for settings in your browser that allow you to do one or both of the following modifications.

- **Allow cookies to be set** for the current session only.
- **Block third-party** cookies.

The first one is an easy solution, but note that when you close the browser, the cookies are deleted so you lose any advantages of using cookies for later visits.

The second option is more useful, however – much of the data you see from the Collusion plug-in is a result of third-party cookies. These are cookies that don't form part of the site you're visiting, but rather

Plug-ins like Do Not Track Plus can extend the default privacy settings of your browser and let you know what sites are trying to track you.

Do Not Track Plus How this works?

ON at [facecrooks.com](#)

4 social buttons tracking you: **0 blocked**

2 ad networks tracking you: **2 blocked**

Opting out blocks you from targeted ads
Quantcast
Dedicated Networks
[What is opting out?](#)

6 companies tracking you: **0 blocked**

ShareThis	Not blocked here
Google AdSense	Not blocked here
OpenAds	Not blocked here
Google Analytics	Not blocked here
Quantcast	Not blocked here
DoubleClick	Not blocked here

[Are these companies?](#)

Superb! Your all-time total is: **7,141 blocked**

Abine.com | the Online Privacy Company

[How this works?](#) | [Settings](#) | [Say Hello](#)

other elements on the site (such as an advert), perhaps from another domain that then sets cookies in your browser, and which are frequently used to track you. By denying third-party cookies, only those from the site you actively visit will be stored (and though these could still be used to track you, the exposure is much less).

In addition to this, or alternatively, there are specialised plug-ins that focus on privacy and can enhance your browser's own settings, such as Do Not Track Plus, which you can access at [abine.com/dntdetail.php](#). It's available in versions for Firefox, Chrome, IE and Safari. Again, even just using this plug-in for a short time can be a real eye-opener, giving you lots of information about sites that try to track you.

Inevitably there's a trade-off whenever you go online – you're not just consuming information from the net, it's consuming information about you!

As Kovacs pointed out in his talk, however, this is in itself not necessarily a bad thing – if you're going to come up against advertising, it might as well be relevant to you. The problem is when you don't know what profile of information about you is being stored, where it's being stored, who's using it and most importantly of all whether you've given permission for it. Which, most of the time, is not the case.

It's important to go in eyes open when you browse the web and, if you feel strongly enough, to take precautions to keep any data about you private. [ETIC](#)

Content Settings

Cookies

- ☒ Allow local data to be set (recommended)
- ☐ Allow local data to be set for the current session only
- ☐ Block sites from setting any data
- ☒ Block third-party cookies and site data
- ☐ Clear cookies and other site and plug-in data when I close my browser

[Manage Exceptions...](#) [All Cookies and Site Data...](#)

Images

- ☒ Show all images (recommended)
- ☐ Do not show any images

[Manage Exceptions...](#)

JavaScript

- ☒ Allow all sites to run JavaScript (recommended)
- ☐ Do not allow any site to run JavaScript

[Manage Exceptions...](#)

If possible, look for a setting that blocks third-party cookies, as seen here in the Chrome browser.

OS CHALLENGE

Tasting Mint

It may be based on Ubuntu, but Linux Mint is a drastic departure for the OS. Ashton Mills explains.

APC EXPERT

ASHTON MILLS

Ashton has been testing OSs since Slackware came on floppies. Before this he was one of the few who used OS/2 (and loved it) and before that, he remembers installing Windows 3.1 NT from 22 floppy disks. His idea of fun is to spend a weekend compiling the latest Linux kernel or testing out the latest Windows beta.

Ubuntu's reign on Linux desktop dominance may soon be under threat with two new releases from Mint, but far from simply being a different take on a user-friendly desktop, the new Mint 13 diverges dramatically from Ubuntu, upon which it's based. And it does so because it's challenging the very direction Ubuntu is taking.

IT ALL STARTED WITH UNITY

Ubuntu's Unity interface has had a number of Ubuntu releases to mature and mature it has become – in our opinion – providing a slick interface that doubles well as both a tablet and desktop design. With the release of Ubuntu 12.04, Unity is now quite polished and a pleasure to use once you get used to it.

And that's the kicker – ever since Unity appeared, there have been many users who don't want to get used to it and instead prefer to continue to use the more traditional Windows-esque desktop design that just about the whole world has been weaned on for over a decade now. A design that Ubuntu, and in turn Mint, followed as well with its GNOME 2 interface up until Unity hit the scene.

The developers of Mint, with the release of Mint 13, have decided to take a different tack and keep alive the 'Start' button/taskbar design that's become so familiar to everyone. This isn't an easy choice to make,

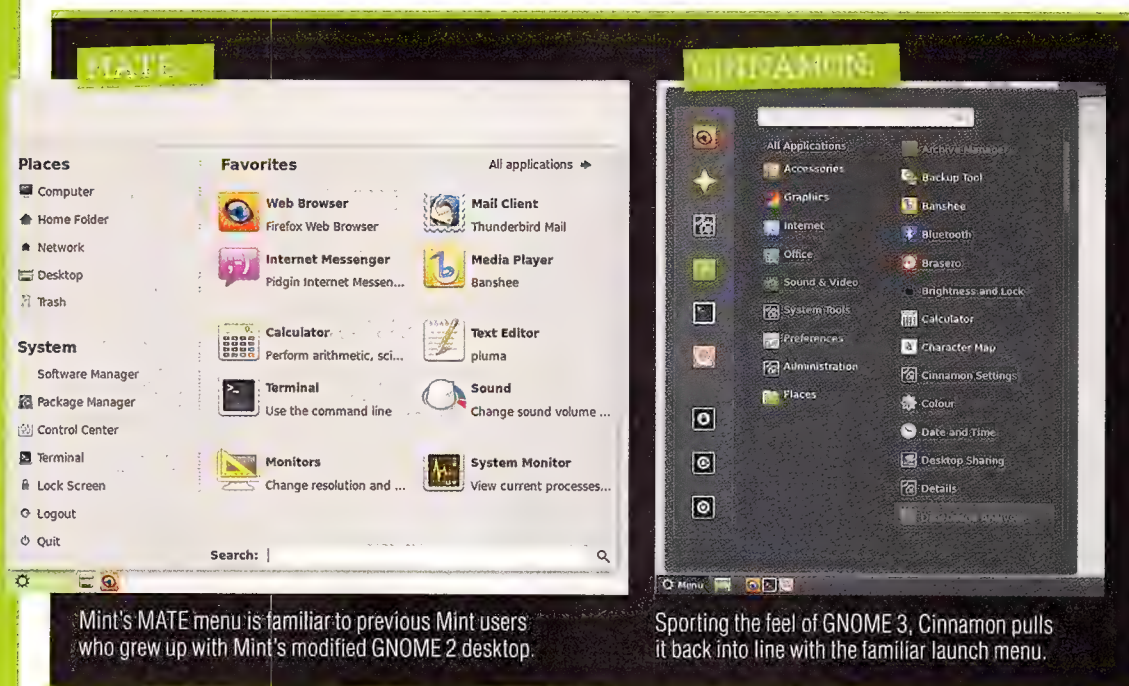
though. GNOME 2 is slowly being replaced by GNOME 3, which in its own way has also left behind decades of user interface design to branch out on a new limb. This means if you're a fan of GNOME or Ubuntu, but you prefer the more traditional desktop design, you're kind of out of luck. And as more distributions move to GNOME 3 and Canonical charges ahead with Unity, if you prefer to stick with the traditional GNOME 2 desktop, your choices are running thin.

Hence with the release of Mint 13, the developers have taken an entirely new path and forgone not just Unity, but the default GNOME 3 interface as well. So, what is Mint 13 using?

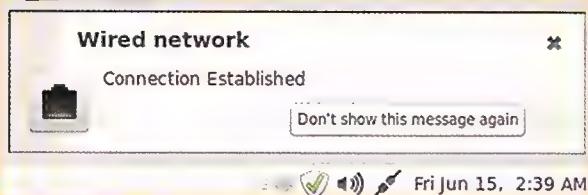
SPICE UP YOUR MATES

Mint is offering two versions of Mint 13 – same base Linux distribution, two different interfaces. The first is called MATE, a name derived from a South American beverage called 'mate' and no real bearing on the interface itself; it's a name primarily to differentiate it from GNOME 3. MATE is a fork of GNOME 2, or said another way, it's GNOME 2 continued, but by a set of different developers.

The goal of MATE is to maintain and update GNOME 2 to move with the times, but keeping within the classic look and feel. This is the closest to the

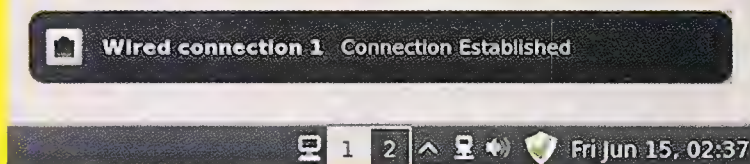


MATE:



MATE's message display looks quite sleek considering its older heritage...

CINNAMON:



...whereas Cinnamon's appears quite bland.

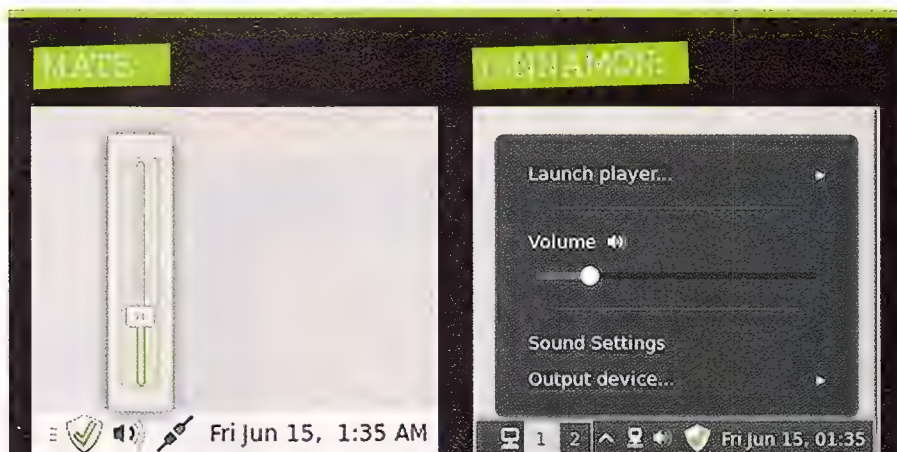
traditional Ubuntu plus GNOME 2 desktop now available, if that's your preference.

The other version is called Cinnamon and this too is a fork, this time of the new GNOME 3. Cinnamon has a different goal to MATE: it aims to bring all the benefits of GNOME 3, while sticking as close as possible to traditional GNOME 2 desktop style. In other words, it's GNOME 3 for the traditionalists!

Mint is the only distribution offering these two alternatives to GNOME 3 on the same base platform at the moment, and this dedication to the classic user interface style everyone is familiar with is rapidly rising Mint's star in the world of Linux distributions. But what do they both look like and how do they compare?

COMPARING THE CONTENDERS

A lot of the differences are easier to see through actual usage, but there are still highlights that demonstrate the different



However, in other areas, as we see here with the tray options for sound...

...Cinnamon and its GNOME 3 base is more advanced.



Common dialogues, such as the networking one displayed here, look quite different between the two.

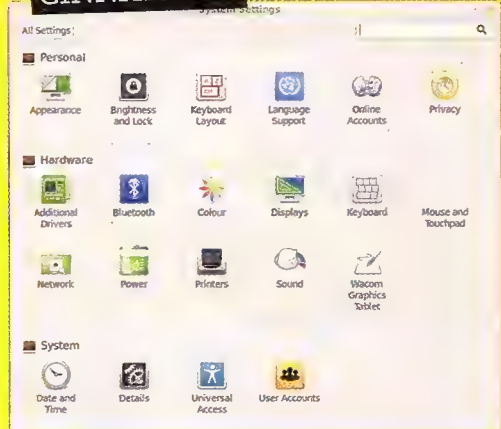
Cinnamon sports the slide switches to enable and disable functions.

MATE:



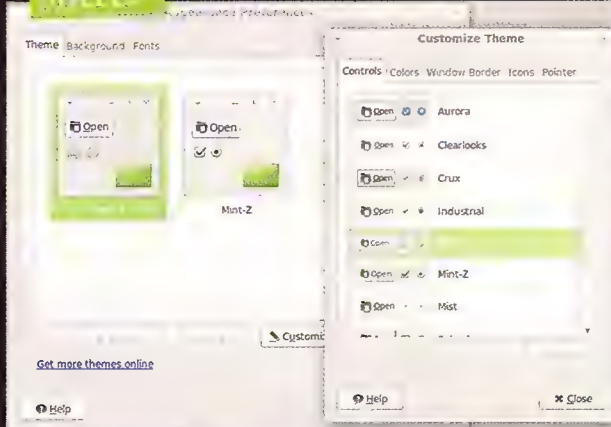
The control panels are quite distinct between the two as well...

CINNAMON:



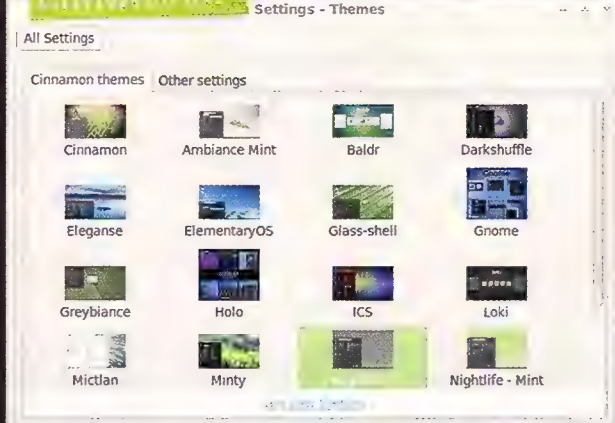
...with Cinnamon's having nicer icons and being slightly more organised.

MATE:



Themes are another area of big differentiation. MATE is much more configurable for individual components.

CINNAMON:

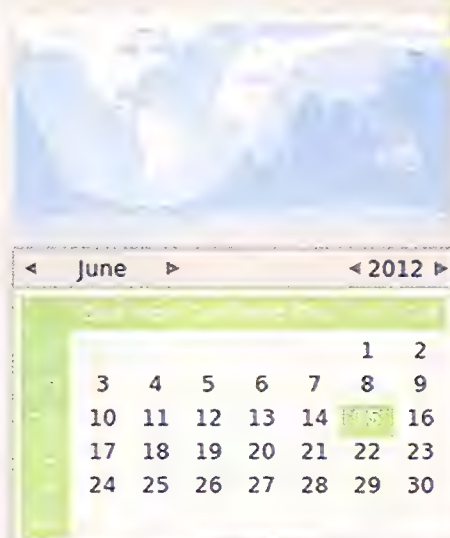


Cinnamon comes with access to a larger range of ready-made themes that you can just click to activate.

Locations

Edit

MATE:



Even common tools like the Calendar sport a different look and feel.

CINNAMON:

And arguably MATE's looks better here between the two.



paths each is taking, especially considering Cinnamon is built on GNOME 3 and could provide new features we haven't seen yet. For now, though, this is how the two interfaces compare.

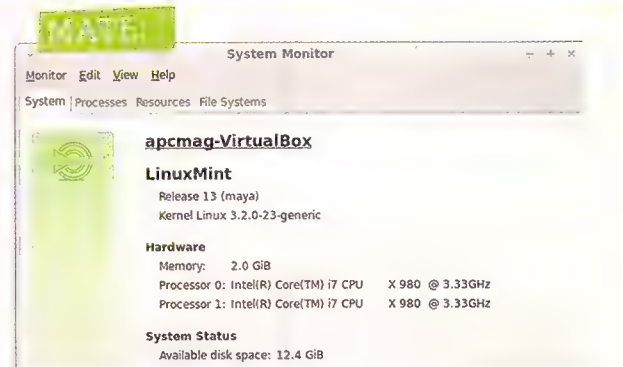
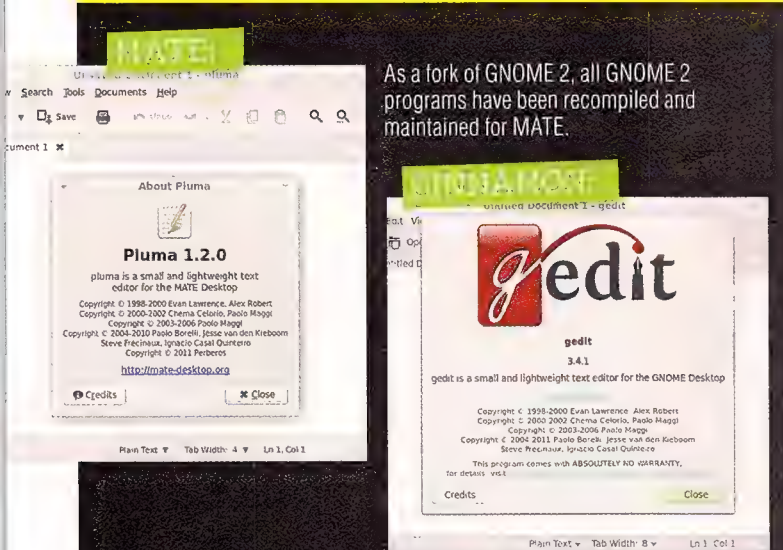
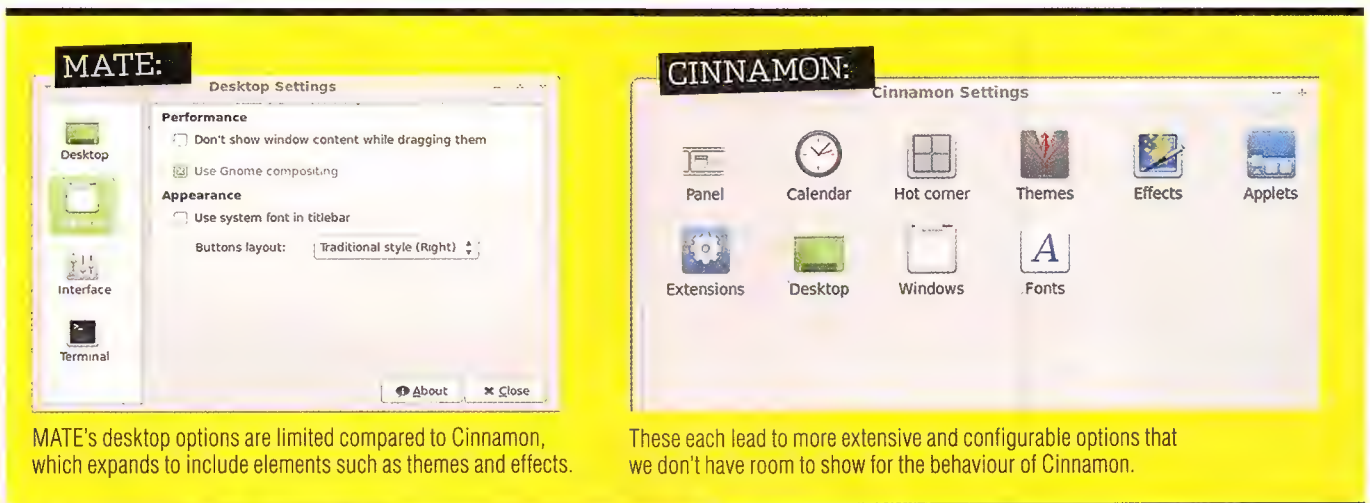
You can't see it in the screenshots, but Cinnamon has other advantages: namely, being based on GNOME 3, it inherits a range of snazzy 3D effects that make the desktop

feel 'slick'. To MATE's advantage, however, is the fact that it's based on GNOME 2 and thus inherits a very stable and polished legacy. Cinnamon, by comparison, still feels like it's missing the odd feature here and there and feels, just like GNOME 3, that it's still in development – because it is.

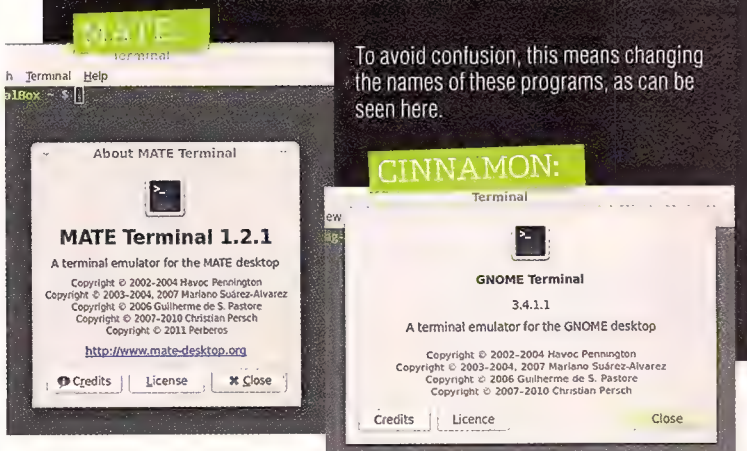
However, the look and feel of apps is mostly the same across both versions –

they're both still GNOME after all. But it's a testament to the Cinnamon development team that it looks and feels so similar to GNOME 2, which is the goal.

Ultimately, though, the success of either version depends on how many users are happy to go with Ubuntu's Unity flow and how many prefer to stick with what they know best. [BLOG](#)



The 'About' boxes for each interface. It's worth noting that 'System Monitor', where this can be found, has no equivalent yet in Cinnamon.



This is one of the GNOME 3 elements that Cinnamon retains, themed for Mint, of course.

IPAD

Watch videos on the move

Jenneth Orantia explains the different ways you can view videos on your iPad.

APC
EXPERT

Jenneth has been writing and obsessing about mobile technology for nearly a decade. Her first iDevice was a Compaq iPAQ, and she counts jailbreaking and installing custom ROMs as two of her favourite hobbies.

If you get an error message, you'll need to transcode your files.

The iPad's large display makes it a perfect fit for watching videos. The easy way to go about this is by loading video files to your iPad's 16GB, 32GB or 64GB of internal storage, which is enough room to fit a decent-sized library of video clips and movies. But this isn't the only way to do it. You can save on space by using one of the dozens of apps and services for streaming content and videos over a 3G or Wi-Fi connection, and you can also use a wireless hard drive.

KEEPING IT LOCAL

For the videos you do want to store locally, you can watch them on your iPad using the stock iOS Videos player if they're in the right format. Transferring a video file is as simple as connecting your iPad to your computer, selecting the file and dragging it over the name of your iPad in iTunes.

If it's not in the right format, you'll get an iTunes error message saying that the file wasn't copied over because it can't be played on your iPad. You've got a couple of options here. One is transcoding your videos so your iPad can play them natively, which can be accomplished easily enough using the free HandBrake encoding program (handbrake.fr).

When you launch HandBrake, it will automatically prompt you to load the video you want to transcode. Click 'Open' when you find it, go to the 'Presets' panel on the right-hand side (click the 'Toggle Presets' button

if you can't see it) and select 'iPad' under 'Devices'. Make a note of the file path under 'Destination', as this is where your converted file will be saved (you can change the destination by clicking 'Browse' and selecting a different folder). Click 'Start' to begin transcoding and you'll see a progress indicator at the bottom of the screen. Once the encoding process is complete, you can drag and drop the final video to your iPad through iTunes.

USING THIRD-PARTY VIDEO APPS

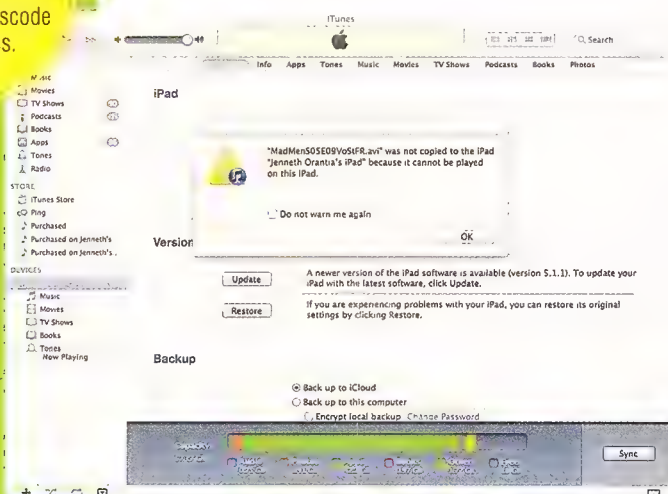
Having to re-encode all of your videos for your iPad is time-consuming. The easier option is springing for one of the third-party apps that can play a wide variety of video file formats. One of our favourites for standard-definition videos is CineXPlayer. This app supports 720p HD playback as well, but we found AVPlayerHD to be more reliable for playing HD videos smoothly.

To transfer video files to either app, open iTunes, click on the name of your iPad in the left-hand column, click on the 'Apps' tab at the top and then scroll down to the 'Apps' section at the bottom of the window. Select the name of the video player you want to transfer video files to, and click the 'Add' button to load the files. Note: iOS doesn't let you share files across apps, so if you load a video to one app, you can't access that same video from any other apps.

STREAMING VIDEOS

There are loads of streaming video services with iPad-optimised apps, such as user-generated video services like YouTube and Vimeo, local video content from providers like ABC iView and niche genre video services like Crunchyroll.

There are also a handful of paid services you can subscribe to if you don't mind paying for content. If you're a Telstra NextG customer, you can download and use the Mobile Foxtel service, which gives you 31 channels that have been tailored for mobile users, including FOX8, Sci Fi, Fox Sports News TV, Sky News, Channel [V] and Disney Junior. Subscriptions start at \$4 for a day pass and go all the way up to the 6-month ultimate combo pass for \$89. The good news is that all of the video streaming done through the Foxtel app is unmetered, although you'll have to turn Wi-Fi off whenever you want to use it. The bad news is that the content is optimised for low-res mobiles, so it looks especially blurry on the new iPad.





A wireless hard drive like the Kingston Wi-Drive saves space on your iPad.

AVPlayerHD plays HD videos smoothly.



Video streaming on the BBC iPlayer isn't high-definition either, but it's a higher quality than you get with Mobile Foxtel if you use it over a Wi-Fi connection, and you get on-demand access (rather than channels with a set programme) to over 2,000 hours of British TV. The shows on offer include *Spooks*, *The Graham Norton Show*, *Misfits* and *Doctor Who*, with subscriptions costing \$9.49 for a month and \$89.99 a year.

Quickflix is a relatively new video streaming service that's just launched for the iPad, offering a range of on-demand movies and TV shows for

\$14.99 a month. The selection is reasonably good and getting better every week; you won't find any new releases here, but there are enough decent flicks available that make it worth at least a one-month subscription. The selection of TV shows is a little skimpy, but again, there are full seasons of good shows like *True Blood*, *The Wire*, *Entourage*, *Sex and The City* and *The Sopranos*.

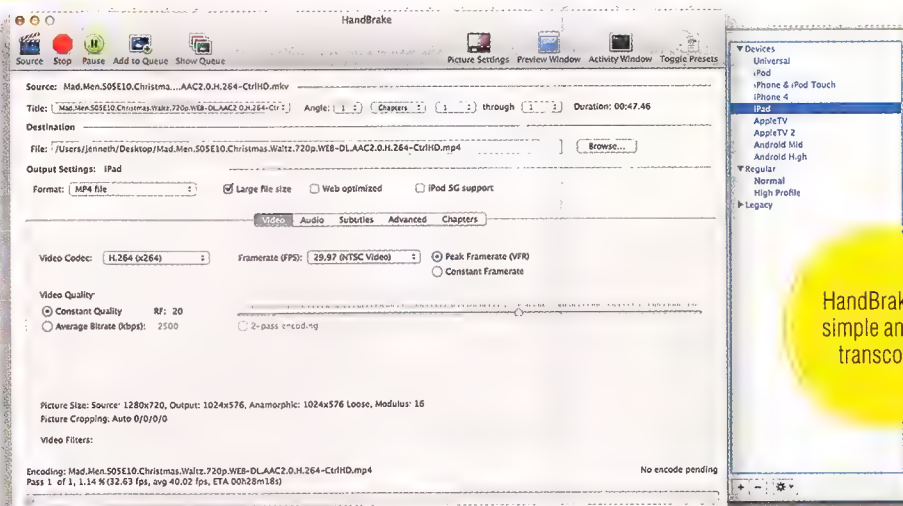
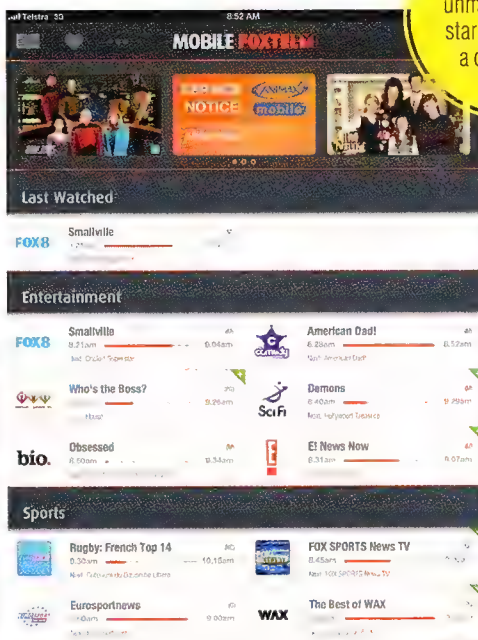
USE A WIRELESS HARD DRIVE

If you're running low on storage, you can also take advantage of wireless hard drives like the Kingston Wi-Drive to store movies. The Wi-Drive, available in storage capacities of 16GB, 32GB and 64GB, works like a regular

portable hard drive, only it has built-in Wi-Fi that lets you access the contents of the drive from up to three other iOS and Android devices at a time. The Wi-Drive creates its own Wi-Fi network and files are accessed using the free Wi-Drive app.

The default view for the Wi-Drive shows all of the files on the drive in a list, but you can browse through them by media type using the tabs at the bottom of the screen. To play a movie, tap on the filename and then tap on the arrow icon in the top-right corner of the screen. This will give you an option to open the file in one of the video apps on your iPad. The only catch to using the Wi-Drive is that it doesn't stream video files in real time – it copies the entire video to your iPad before you can play it. **ETC**

Mobile Foxtel is unmetered and starts at \$4 for a day pass.



HandBrake is a simple and fast transcoder.

IPHONE

Back up your iPhone

Don't risk losing all the precious information and files on your phone — use one of the following techniques to back it up.

APC
EXPERT

JENNETH
ORANTIA

Jenneth Orantia has been writing and obsessing about mobile technology for nearly a decade. Her first i-device was a Compaq iPAQ, and she counts jailbreaking and installing custom ROMs as two of her favourite hobbies.

You've probably got lots of important files on your iPhone: photos of your friends and family, video clips, phone numbers and text messages. iTunes automatically makes a backup of your iPhone every time you sync it with your computer (assuming you haven't switched your backups over to iCloud), and the idea is that if you lose your iPhone, or it bricks and you need to do a system restore, you can load your most recent backup and be right back where you left off.

But what if you can't afford a new iPhone and/or you decide to switch to a different smartphone platform like Android or Windows Phone? The bad news is that iPhone backup files are in a proprietary format designed to be read only by iTunes. The good news is that you can still retrieve all your data using a Windows application called iPhone Backup Extractor or a Mac application, also called iPhone Backup Extractor. Using these programs, you can retrieve photos, videos, contacts, call history, SMS, MMS, calendar entries, notes and app data.

iPhone Backup Extractor for Windows (www.iphonebackupextractor.com)

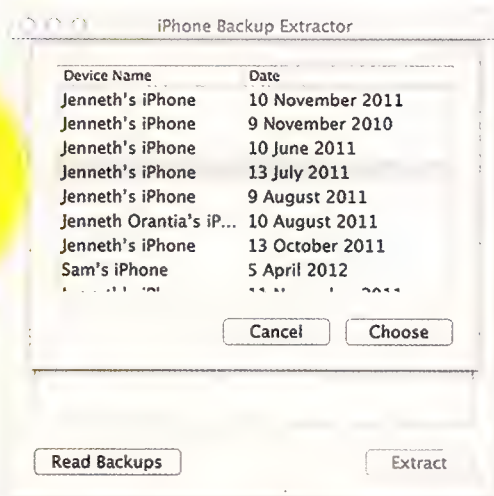
comes with a free version, but it only lets you extract two files at a time. If you want to extract all of your files at once, you'll need to fork over the US\$24.95 registration fee. To use this program, you'll first need to find the backups on your computer. On a Windows PC, all iOS backups are found at C:\Users\[username]\AppData\Roaming\Apple Computer\MobileSync\Backup. All the files from each backup are kept in a folder named after the iOS device's UDID identifier.

If you back up multiple iOS devices to the same computer, you'll see a few different UDIDs in the backup folder. Never mind if you don't know which UDID is your device — just load one at a time and iPhone Backup Extractor will tell you the name of the iOS device the backup belongs to.

Once you find the right backup, you'll see all the files you can extract under 'Available data'. The different file types are hyperlinked; clicking on any of the links will let you save that data type to a folder you specify. Contacts are saved as individual vCard files,

YOU CAN STILL RETRIEVE ALL YOUR DATA USING A WINDOWS APPLICATION

Use iPhone Backup Extractor to restore your backup to a non-iPhone device.



while call history and SMS are saved as CSV files (which you can open in a spreadsheet program like Microsoft Excel), and notes are saved as individual HTML files (which you can open in a web browser).

If you're a Mac user, you can use the free iPhone Backup Extractor (supercrazyawesome.com) to grab files from your backups. Launch it, and then click 'Read Backups'. It automatically finds all the backups on your computer and lists the name of each iOS device to make it easier. But you'll need to jump through a few more hoops to use this program; once you load the right backup, select 'iOS Files' in the next window, then specify the folder you want to save the backup files to.

Photos and videos are saved to Media/DCIM/100Apple and the rest of the data can be found in its respective folder under the Library folder. All files have a .db extension, which you can open with SQLite Database Browser (tinyurl.com/2353lo). tinyurl.com/2353lo

ANDROID PHONE

Get the most out of Instagram

Instagram is better when paired with other apps.

APC
EXPERT

ANDROID
CUSTODIAN

An Android enthusiast since the days of the Dream, Simon has watched the fledgling OS grow from curio to juggernaut, and has rooted, ROMed and tweaked more devices than is polite to speak of. Join him as he shows you how to make the most of that Android powerhouse in your pocket.

I'm a total Instagram convert. I've loved slapping filter effects on my photos since the early days of Android (largely thanks to the excellent app Camera ZOOM FX), but I was never a rabid addict until... Instagram! There's something addictive about the simplicity and inspiring about the timeline that keeps me shooting.

Yet it was the timeline feature that initially baffled me. I started seeing triptychs and images coming up on my feed that were altogether too beautiful. I wondered: were they features that iPhone users had that us Android plebs missed out on? So I dug around a bit and realised that the very best Instagrammers actually use a selection of apps to perfect their images. From frames to funky effects, the use of a workflow-style suite of apps will bring out the very best in your images – in Instagram or elsewhere.

The most common (and best) effect to add outside of Instagram is a frame. You can add a simple border around a single image, or you can combine multiple shots into a single image, scrapbook style. For either outcome, I use PicFrame (99c on the Play Store). PicFrame allows you to combine up to five photos in an array of frames. You can also pick the width of the frame (or remove the borders completely), its colour and how rounded you want the corners to be. Alternative apps include Photo Grid (free), PhotoShake! (Free or \$1.69 Pro) or Diptic (99c).

Get creative with the images in the frames! The most obvious application is to tell a mini story, but you can also do things like combine

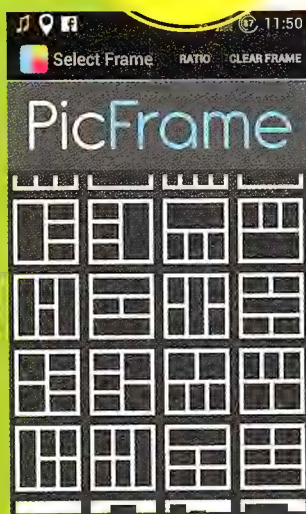
two images of different objects in a way that links them, or combine images of the same scene, but with repeated objects or people in it (doppelgängers!).

You can also run your photos through Instagram's filters *before* you move them to PicFrame. Consider taking a photo, making two copies with different effects and then combining them together (with or without visible borders). It can really bring attention to two different aspects of a single image, or create an eye-catching top-and-bottom frame. You can also run your images through another app's filters, such as Camera ZOOM FX (\$3.99), Vignette (\$3.99), or Camera360 Ultimate (free), among many others.

Instagram sets itself apart from the slew of photo editing apps in that it also includes its own (well-populated) social network. So, if you're sharing your images, you might as well try to get them noticed. To do this, you need to use hashtags. Anyone familiar with Twitter will already understand hashtags, but for those who don't, they're simply keywords that describe your image, optimised for searches. For instance, #lake, #food, #park are obvious ones that would return your image when searched, along with thousands of others. To get noticed, however, you should also try combining them with more specific tags, such as #lakeeyre, #sausage or #hydepark. Also, keep your eye out for hashtags that describe a type of photo (#lookingup, #wakeuppics or #ministry, for example) or trending tags in the 'Popular' section of the app. [ETC](#)

PicFrame allows you to combine photos to create works of art.

Put interesting images together.



Combine photos scrapbook style.



ANDROID TABLET

Optimise a tablet for the car

Getting the software right for the best car experience.

APC
EXPERT

An Android enthusiast since the days of the Dream, Simon has watched the fledgling OS grow from curio to juggernaut, and has rooted, ROMed and tweaked more devices than is polite to speak of. Join him as he shows you how to make the most of that Android powerhouse in your pocket.

Tablets are the new carputers. Gone are the days of having to source components, wire a computer to your car's power supply, or wait for startup and shutdown processes. Tablets offer an all-in-one package, and with a little elbow grease, can look quite the part when installed in-dash. Of course, an in-dash install guide is beyond my geek skills, but we have covered it in a past issue (APC April, page 104). What I can help you with, however, is setting up the tablet for the best possible in-car experience.

There are two types of tablet installs: permanent (usually in-dash) or removable (some kind of dock/cradle). This guide is aimed at those with permanent installs, but I'm sure you'll be able to modify it to be more suitable for removable tablets; you're a smart cookie, after all.

The ideal setup here has the tablet hooked up to your head unit using either Bluetooth or the headphone port. If your head unit has Bluetooth functionality, make sure it can pair with two devices at once, as you'll want an A2DP audio connection to your tablet in tandem with a hands-free connection to your phone. If applicable, you'll also want to make sure that your steering wheel controls work with any A2DP Bluetooth devices.

So what type of optimisations am I talking about?

Well, consider what happens when you turn your car off with a regular stereo: the music pauses, the navigation turns off and the device stops draining your battery. The last problem should have been solved when you installed the tablet (if not, you're doing it wrong!) and we can take advantage of that change in power state to trigger a host of events, thanks to the magic that is Tasker (\$5.99).

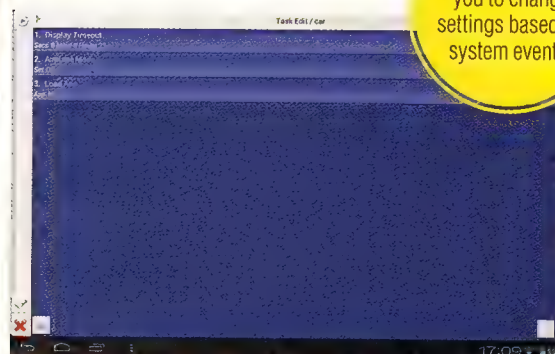
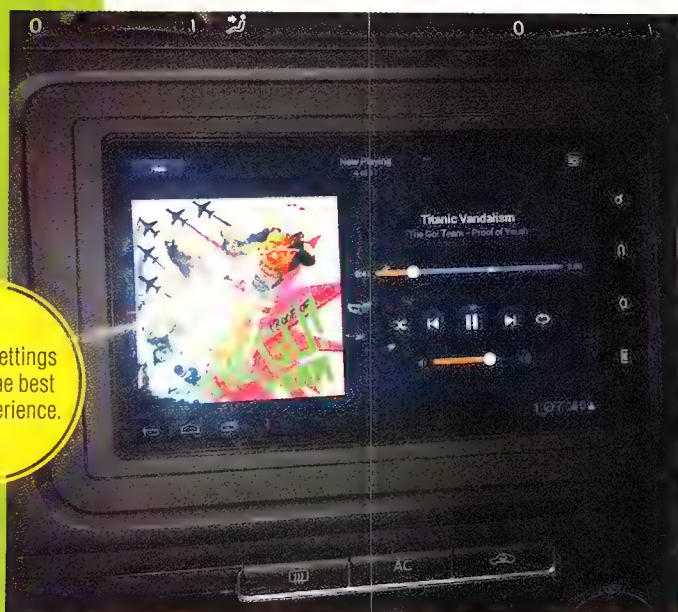
Tasker allows you to change settings based on system events – it's very similar to Locale and is even compatible with Locale's plug-ins. In this context, the most advantageous state to use as a trigger is the power connectivity (or car dock, if applicable to your setup). For instance, when you turn on the car (device is charging), you can turn on your data, turn on Bluetooth, open up your music/streaming/any other app and stop the screen from turning off.

To set this up, you need to create a new profile. Click on the '+' under the 'Profile' tab. Then name it, select 'State' and 'Power' (unless you want it to trigger when you place it in a dock), and 'Source' as 'AC'. Next you'll be prompted to create a new task. You'll want multiples here: 'Display > Display Timeout > 23 hours', 'Net > Airplane Mode > Off' and 'Net > Bluetooth > On'. You can also set it to launch your preferred music application (streaming vs local) or even Car Dock Home under 'App > Load App'.

Conversely, set Tasker to do the opposite of the above when it's disconnected from power. The reason I specified Bluetooth 'on' in the above task is because when you turn it off in the 'disconnect' profile, your music app should pause. I've heard you'll also have a bit more success reconnecting Bluetooth if you set the device to go to the home screen during the disconnect, too ('App > Go Home'). **BONUS**

Tasker allows you to change settings based on system events.

Get your settings right for the best in-car experience.





workshops

HANDS-ON WITH HARDWARE & SOFTWARE

INTERNET

Bypass online censorship

Jon Thompson shows how web surfers living in repressive regimes break into the free world.

YOU'LL NEED THIS

FEEDBURN

The free RSS reader, for getting information directly.

INTERNET

Used in repressive regimes to tunnel out to the free world.

In a speech at Stanford University in February 2008 Bill Gates said he wasn't worried about online censorship: "I don't see any risk in the world at large that someone will restrict free content flow on the internet," he said. He was wrong.

While the world debates the need for legislation to stop the downloading of illicit copies of commercial digital products, governments are increasingly using censorship as a reason to 'protect' us from what they consider undesirable. In some countries, that protection extends to the suppression of basic human rights and news about atrocities.

Even in Australia, the chances of accidentally stumbling upon paedophilic images online are very remote. They're so illegal that they're kept hidden away behind paywalls. Politicians, however, still insist there's a real chance of bumping into such material, and use it as a reason to censor the internet. We're sensible, law-abiding citizens; given we won't seek out illicit material, we deserve an uncensored internet. So, how do people bypass online state censorship?

The main problem with online censorship is that it's a very imprecise art and is usually done on the back of moral panics, or on the whim of unaccountable individuals. In some cases, censorship is done to look good in front of voters rather than to solve real problems. The issues are also technological. Unless you know where all the holes are

in your censorship scheme, and have the resources to do so, you can never hope to plug them all.

Sites may be blocked by the state for a number of reasons. Sometimes, however, those reasons seem arbitrary, or have more to do with the moral compasses of the people making the censorship decisions, rather than any real threat to society. In some countries, internet censorship is ordered by special state agencies and carried out by individual ISPs. In others, the police simply decide what is to be blocked.

In China, for example, the list of banned web sites is circulated to ISPs, who are expected to implement it without question. This list changes almost weekly, as the political climate changes. China also employs a large army of internet enforcement officers whose job it is to monitor forums, blogs and web sites and report on what they find. Without question, if the state doesn't like it, no one in China will see it. Search for the Tiananmen Square massacre of 1989 in China, for example, and you'll find only tourist information, or maybe a warning not to search for such things.

In Finland, unaccountable members of the police decide what is to be banned. In the fight against 'child pornography' they've banned a disproportionate number of web sites, including some in favour of same-sex marriage and even those critical of the bans. In Saudi Arabia, censorship extends to online clothing catalogues showing swimsuits. This tells us more about the attitudes and proclivities of the people doing the censoring than the people they're trying to 'protect'.

AD HOC BYPASS

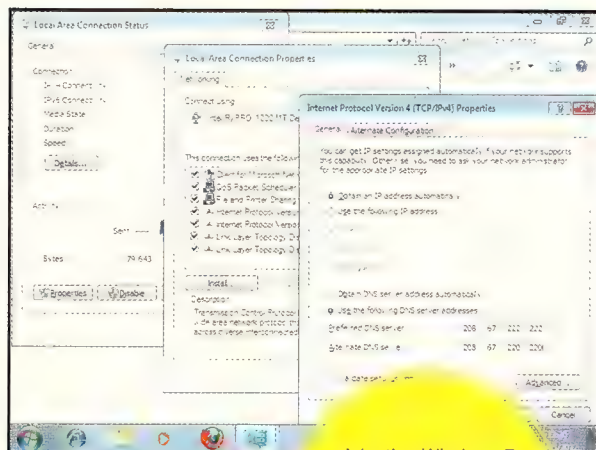
Some internet censorship systems can be bypassed in an ad hoc fashion. This can be done when such systems simply check the URL you want to access against a banned list. When this is the case, if the URL can be made to seem different, the system can be defeated.

The first thing to try is shortening the URL. You can easily shorten a URL using a service such as **tinyurl.com**. If the filtering product keeping you away from a domain knows this trick, it expands the domain

WE ARE CENSORED

The majority of workplaces now censor the web to prevent employees wasting large amounts of time surfing the internet, using Facebook and other social media networks.





Adapting Windows 7 so it uses an alternative DNS server is a censor dodger that's just a few clicks away.

SWAP DNS PROVIDER

One way the internet can be censored is via DNS filtering. This involves knocking out entries in DNS so domain names won't resolve into IP addresses. No DNS entry, no web content. If your ISP filters DNS entries, you don't get a choice of whether or not you see a site. Luckily however you can choose who provides your DNS services.

When you boot your broadband router, part of the information returned from the ISP is the address of their DNS servers. When you boot a computer on your network, the DHCP software in your router supplies this address to the booting machine. You can simply tell router and computer to use a different server, and there are plenty to choose from – all free.

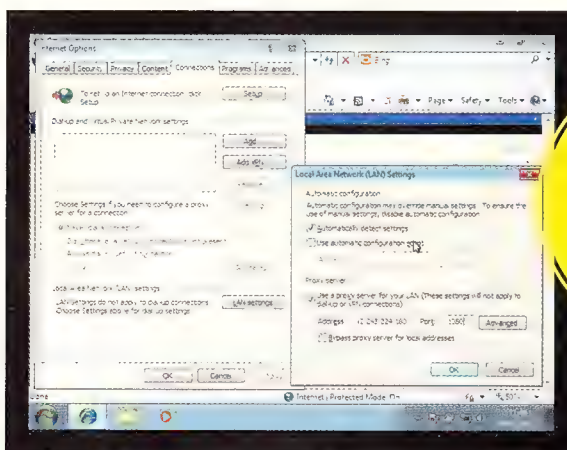
While the exact details of adding such a static DNS server to your router will entail reading the manual, changing Windows is simple. On the Start menu, enter the word 'network' and select 'Network Sharing Centre'. In the sharing centre, click 'Change Adapter Settings' and then the icon for the local area network. Click 'Properties', then double click 'Internet Protocol Version 4'. In the next window, click 'Use the following DNS server addresses' and enter the primary and secondary addresses of your preferred DNS service.

There are many free, public DNS services. Google provides one using addresses 8.8.8.8 and 8.8.4.4. Another popular one is OpenDNS (addresses: 208.67.222.222 and 208.67.220.220).

S FOR SUCCESS

If you normally surf to the HTTP version of a site and this is blocked, try adding an S to the end of HTTP.

This asks the remote server for a secure connection. However, if the web filtering system that's preventing access doesn't know about the HTTPS version, you still may be able to gain access.



Using a public proxy means people will only see your connection to the proxy, not banned sites.

name, checks it against the banned list and blocks it accordingly. It's time to up the ante by using the raw IP address in the browser's URL bar. The ping command (from the command line: 'ping <domain name>') will request and display the IP address of a domain from the local DNS server. However, some filtering systems weed ping traffic out for this reason. If we can't use the ping command, how do we get at it?

The solution is to use one of the many free online domain IP address lookup services. Unless all these services are also blocked, this should work, thereby also hinting at the problems of trying to censor something as complex and interconnected as the internet.

One lookup service is the aptly named IP-Lookup (tinyurl.com/cbq393q). Simply enter the name of the domain you want to reach without the 'http://' preamble, and press 'enter'. The IP address appears, but the site also attempts to contact the domain itself and produces a thumbnail of the web page to show that the IP address is good.

Copy the IP address into your browser and press 'enter' to attempt to bypass censorship. But what if the IP address of the target domain is also blocked? This is where we need to think like hackers and become a little indirect.

INDIRECT BYPASS

When you use Google Search, many of the results are based on cached versions of the web pages, rather than the live pages.

This is useful for getting around web censorship measures, because along with the title of the pages in most Google Search result lines there's a 'cached' link. Click this and you can read a version

of the page stored and accessed from Google's cache server farm.

However, as new features are added and old ones tweaked, the user interface to Google changes frequently. In some browsers the cached links are not available due to cookie issues. There is a way around this, however. Search for the web site you want, then copy the URL from the search results back into the search input box. Add 'cache:' at the start and press 'Enter' to read the Google cache version of the page. For example, to read the front page of APC mag, enter 'cache:http://apcmag.com'.

This technique is great for individual pages, but if you click on any content in the cached version, Google will attempt to load the real thing. You have to load each page by hand. If you want more freedom to surf, you'll need to use a public online proxy.

A proxy is like a fulcrum on a lever. You move one end of the lever so that the other end points to wherever you want it, and all the action pivots around the fulcrum. Similarly, a proxy server acts as a focal point, relaying your requests for web pages to the sites you want to surf and collecting the results to pass back to your browser. Any web censorship software in place only sees your web connection to the proxy server, not to the sites you request.

Plenty of free public proxy servers exist that will act as such a fulcrum. A searchable list is maintained here: tinyurl.com/d342vy. This list refreshes itself in real time and lists the country, IP address and relevant port, and the speed of proxy servers. If you sort the list by response time and click 'Update Results' you can find a good fast server with plenty of throughput. Note down the IP address and port number.

Configuring your browser to channel your surfing activity through a public proxy is easy. In Internet Explorer 9, click 'Tools > Internet Options'. In the window that pops up, click the 'Connections' tab and click the

USE ULTRASURF

Ultrasurf is a piece of software designed for use in repressive regimes to circumvent web filtering measures. The makers claim that every time there's a major crackdown or world event, its use leaps.

The idea behind Ultrasurf is that it connects your computer to a proxy not covered by censorship, which in turn allows you to surf in encrypted secrecy. You can download Ultrasurf from www.ultrasurf.us. There's no need to install the package. Just copy the executable from the zip archive and click it to run. You can copy it to a USB and take it with you.

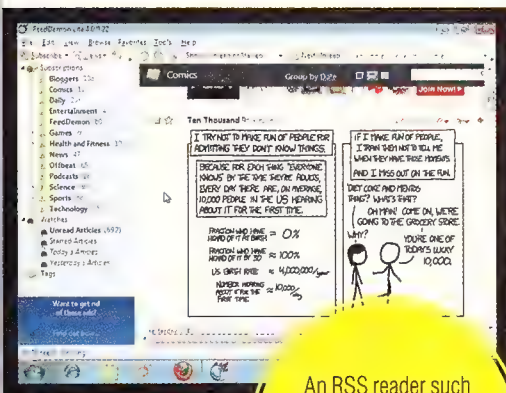
Ultrasurf will open IE by default, but we can change that. The user interface is simple and shows the performance of the server to which you're connected. Click the 'Option' button and a sub-window opens. To disable automatically starting IE, deselect 'Start IE automatically'. Restart Ultrasurf for this to work.

If you need to connect to the Ultrasurf servers via a proxy server, click 'Proxy Settings' then enter the IP address and port number. Click 'OK' and finally dismiss the Options window. As long as you run Ultrasurf before starting your web browser, all traffic should now be tunnelled securely through the Ultrasurf servers instead. You can also hide the



Adapting Windows 7 to use an alternative DNS server is an effective measure that's just a few clicks away.

fact you're using Ultrasurf by selecting the options to hide the Ultrasurf interface window and the lock logo in the taskbar. To show the interface once Ultrasurf is running, press Ctrl+Alt+S.



An RSS reader such as FeedDemon may let you see info you can't read directly on banned pages.

'LAN Settings' button at the bottom of the window.

A sub-window appears. Click the 'Use a proxy server for your LAN'. This enables the input boxes for the IP address and port details you noted down earlier. Enter these, tick the 'Bypass proxy for local addresses' box, then click 'OK'. Click 'OK' on the mother window and try surfing to a site.

In Firefox 12, click the orange Firefox button at the top left of the browser window and click 'Options'. In the resultant window, click 'Advanced' and click the 'Network' sub-tab. Finally, click 'Settings'. A sub-window appears. Select 'Manual proxy configuration' and the input boxes become enabled. Enter the IP address and port of the proxy server. In the box marked 'No proxy for' enter the network number of your local network in the form '192.168.1.0/24'. That fourth number is always zero, but substitute the local subnet for the first three numbers if they're different. Click 'OK' to finish and 'OK' on the

parent window. The response from any web sites you now surf to will seem to be slower and the connections can be flaky. But using a proxy is the go to method of bypassing censorship for millions of people living under regimes who control information.

GETTING ESOTERIC

Activists have developed esoteric uses for common web services in the search for information about the world. One such service is the translation services offered by Google, Babel Fish (babelfish.yahoo.com). The idea is to translate a target web page from English into another language and back again. As this is done, the translation engine fetches the page itself; you never have to surf to it directly. The quality of statistical translation is now so good that in many circumstances the nuances of language survive this process. Be prepared for a few hilarious mistranslations, however.

If you just want information rather than direct access to web pages, RSS may be the solution. Not all sites carry an RSS feed, but if the filtering system blocking access only deals with web traffic (HTTP and possibly HTTPS), installing an RSS reader might work.

One such RSS reader is FeedDemon (www.feeddemon.com). You can download and install it by accepting the default settings. When it runs the first time, it will set up default feeds and begin populating them. If you see the number of feeds to be read increasing in the left

RESOURCES

The TinyURL shortening service: tinyurl.com

IP-Lookup, for turning URLs into raw IP addresses: tinyurl.com/cbq393q

A long real-time list of public proxy servers for subverting web censorship: tinyurl.com/d342vy

Translation services such as Babel Fish will retrieve web pages without you going near the target domain: babelfish.yahoo.com

RSS readers such as FeedDemon enable people to see news from the world outside their country: www.feeddemon.com

hand pane, then RSS traffic is not being blocked and you can happily read away. Another way of dodging censorship is provided by Web2Mail. If a URL is banned, send an email to www@web2mail with the URL of the web page you want to access. The service should email you back the web page so you can read it in your email client.

So, there are ways around even the most repressive regime's online censorship efforts. The

problem for governments is the web developed organically, without any central plan. This makes it very difficult to censor without the world agreeing to it. So information will always get out. How long that continues is up to us. **ETIC**

SIDE BENEFITS

Changing from your ISP's default DNS server can have unexpected benefits. A dedicated DNS company usually provides better name-resolution speed. They can also protect you from malicious web sites by redirecting requests elsewhere. They'll sometimes block misspelled domains set up to infect the unwary.

LINUX

Upgrade your office software for free

Discover the best open-source alternatives to expensive software. **Graham Morrison** shows you how.

YOU'LL NEED THIS

All the software we discuss is available for the majority of Linux distributions, but we recommend the latest release of Ubuntu — 12.04. This is a long-term release and will be supported for three years on the desktop and five years on a server. You'll also need a decent internet connection, as most of the packages we mention are large.

PAID-FOR OPTIONS

Just because it's Linux, doesn't mean you have to ignore all the commercial alternatives. Home Accountz, for example, is an easier alternative to GnuCash for accounting, and one that's worth the money, while Crossover, a commercial version of Wine, makes installing and running Windows apps much easier.

When it comes to office programs, most people have a preference for Microsoft products. Often, this isn't an opinion based on technical merits, it's usually because Microsoft products are the only ones they've ever used, and they're the only ones used by their colleagues and contacts, too. But people can change, especially when money is a motivating factor, and there are many other good reasons to consider open-source and free alternatives.

The first is that the software is often just as capable. As brilliant as Microsoft Word and Excel are (and they are!), the vast majority of users access only a small subset of their features. And you can find those features in the majority of alternatives, often hidden in the same menus or similar-looking icons. Unless you're an Excel genius who riddles their sheets with hundreds of macros, Calc from LibreOffice can do as good a job. The same is true of the formats used to transfer files between different suites. Free alternatives now do a good job of aping Microsoft's native containers and, thanks to the likes of Google Docs, people have got used to the idea that not every text document comes as a .DOC file.

WORD PROCESSOR

There are several fully fledged free office suites available for both Windows and Linux, but the best is LibreOffice. It's the successor to OpenOffice.org and is functionally identical, even supporting many of the old extensions and it's being developed at a much faster rate. LibreOffice includes a word processor, spreadsheet and presentation builder, along with a database, equation editor and drawing tool, all of which are more than capable of everyday office work. This suite is so common that the latest release of your favourite distribution more than likely already has the packages installed, and if they aren't, they won't be more than a 'libreoffice' search away in the package manager.

The most commonly used application in any office suite is always the word processor. In

LibreOffice this is called Writer and it works exactly as you'd expect it to. The only real issue to be aware of is file formats. LibreOffice apps can be launched independently, but they all share a common settings dialog and you should open this first from 'Tools > Options'. This is because the first thing you should do is change the default formats used by Writer and the other LibreOffice apps to mitigate the inevitable confusion that sending an open format to someone will cause.

From the Options window, click on the 'Load/Save' list followed by 'General'. On the lowest border of this window, you'll find a list of document types next to another list of 'Save as' formats. Change these for each type. We recommend Microsoft Word 2007/2010 XML for text documents and the equivalent with Excel and PowerPoint for spreadsheets and presentations. Now whenever you save a document from one of these applications, the default format will always be a Microsoft one.

SPREADSHEET

As we mentioned, Calc is the spreadsheet bundled with LibreOffice and, like Writer, it's a tour de force of sober functionality. Likewise, if you've ever used a spreadsheet, Calc won't require much reorientation. It can import many documents, but complex VB macros will cause it problems, although this is only usually when you edit them. You can, however, preserve any macros you find in a spreadsheet that's sent to you. When you open a file, only change the text, cells and graphics, and when you save the document using a Microsoft format, the VBA macros will still run

BIG OFFICES

For larger office environments, we'd recommend using a distribution that uses the older Gnome desktop or Cinnamon, rather than one with Unity or Gnome Shell. This is because they both feel more like Windows, and won't bewilder new users with a new way of working while they're still trying to get their heads around the software.

You'll find plenty of templates for most applications online.

Some apps force you to better understand what you're doing.

Accounting program GnuCash uses a double-entry book-keeping system.

correctly in Excel. Alternatively, if you're worried about the security implications of passing on macros you've not seen running, you can choose to delete them. Open the 'Options' window again, and go to the 'Load/Save' tab followed by 'VBA Properties'. From that window, you can choose whether you want executable code loaded and saved within its original format. That should ensure even if the shared spreadsheet includes VBA, you can still work with the numbers and return the sheet intact.

We'd argue that if you use Excel to this extent, it's worth staying with Excel. Free software shouldn't directly compete with any particular feature, it's just a good fit for the way most people use these applications – in the same way we seldom use most of the features of a word processor. This is where applications like Calc make the most sense. You can import comma-separated values, for instance – enter the same formulas you'd enter into Excel, using the 'Input Formulas' field and generate graphs by selecting a range of cells and using the 'Insert > Chart' menu option.

ACCOUNTING

There isn't a free software equivalent to the point-and-click ease of accounting software like Quicken or Microsoft Money. But there is software that's just as capable of keeping on top of your accounts. The best is called GnuCash, which should be just a click away through your distribution's package manager. The most important aspect to getting the most from it is understanding the double-entry accounting method. This is where every transaction has a source and a destination. When money leaves one account as a debit it needs to appear to be credited to another, even if the account is for company expenses. Only in this way can

THE BEST OF THE REST

Free software has filled the majority of holes when it comes to alternatives to the commercial packages you might be used to. For presentations, for example, the best choice is likely to be Impress, which is another application bundled with LibreOffice. Impress can import PowerPoint projects and perform many of the same tasks. Its only weakness is that it doesn't have very good dual-screen support when a presenter needs a different view to the audience. This can be enabled, however, by installing the Presenter Console extension from Oracle. This free addition will give you a new display for showing previous and next slides, your notes and a clock, making presentations much easier to manage. Viewing PDF documents is also easy. There is an official Adobe client, but it suffers from performance problems. We'd recommend either Okular or Evince, as they're much faster and better integrated with your desktop.

If you use Outlook for email, the closest match is Gnome's Evolution client. It integrates

contact information, a journal and your email, and can also connect to Exchange 2000 and 2003 servers, making it the perfect drop-in replacement. Multi-client instant messaging can be accomplished with Pidgin or Kopete, and if you need a Twitter client, our favourite is Choqok. It has a tabbed interface and lets you easily add live searches, as well as keep on top of your multiple identities. Finally, if you like to make notes with Evernote, there's a compatible free software client called NeverNote that includes almost all the features and a very similar user-interface.

each transaction be verified against the money going out and the money coming in – a process known as balancing.

When you first start GnuCash, you need to choose 'Create a new set of accounts' from the launch wizard. This will take you to 'New Account Hierarchy Setup'. After selecting a currency, you'll need to choose the default set of accounts to be created. This is important, because you need to put each credit and debit into an account

category to make sense of your spending. With a personal account and the double-entry method, for example, you'd remove some money from your checking account and place it in the groceries account (an expenditure). You can easily create your own, but starting with a decent template may help keep your motivation up. We suggest selecting the 'Business Accounts' category and augmenting this with other

The Evolution email client integrates brilliantly with the Gnome desktop, and can talk to most Exchange servers.

categories to fit your circumstances. You can see a list of which account will be created on the right. After clicking forward, you can now change the name of the accounts and enter your opening balances.

After creating the accounts, you can begin accounting. To enter a payment for diesel, for instance, double-click on the checking account to open it on a separate page, enter a description in the first empty transaction, choose 'Expenses: Auto:Gas' for the transfer and place the amount in the Withdrawal column. You may also want to consider importing files from your online accounts, such as Quicken. GnuCash is pretty good at adding .QNX files to your current account configuration and this can be done via 'File > Import'.

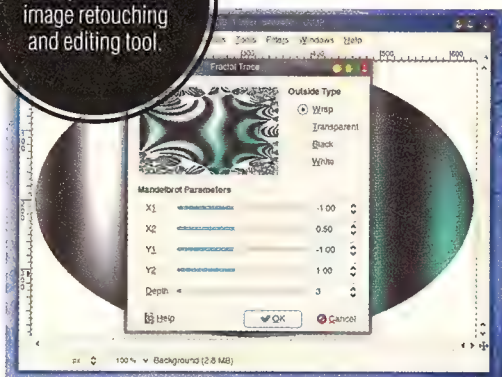
IMAGE EDITING

It's likely you've heard of Gimp, simply because it's got a stupid name. But get past this and you'll find a substantial and comprehensive image editor. Version 2.8 has just been released and while the developers haven't yet changed its name, 2.8 is a massive improvement over previous versions – for one reason. It has unified the wayward palettes and panels into a single window, making the application far easier to manage. But the single window mode is a new option. Enable it at the first opportunity by toggling the option in the Windows menu.

If you've used an older version of Photoshop, Gimp will feel familiar. It uses a variety of palettes to group functionality and a main window to show the image. This default behaviour can be changed, but on first launch the tools palette can be found on the left, while the layers, colours and tool options are on the right. They can be dragged around and enabled/disabled from the Windows menu. Most of the time, you'll be loading an image, using the Colours

menu to adjust brightness, contrast and saturation before scaling the image from the 'Image > Scale Image' menu and saving the file to a portable

Gimp is a comprehensive image retouching and editing tool.



EMULATING WINDOWS

Sometimes, despite the many alternatives, there isn't a free software equivalent to the applications you may need. This might be because they're bespoke, or it might be because the quality of any alternative isn't good enough. In these cases, you can still run the applications from the Linux desktop using a tool called Wine.

Wine is an open-source recreation of many of the Microsoft libraries, which lots of Windows applications use. It's comprehensive enough to run Microsoft's Office suites and many other tools besides, and you can get almost native speed.

To install Wine within Ubuntu, look for and install the Microsoft Windows Compatibility Layer (meta package). With Wine installed, open a terminal and type 'winecfg'. This will create a configuration file to tell Wine where to place your application files, and which location to use as a pretend C drive. You shouldn't have to make any changes to this file yourself. Now locate the Windows executable you want to run – either

as a download or off the original CD/DVD, and from the terminal type 'wine' followed by the path to the executable.

If you're running an installer, let it continue. Many will add their icons to the desktop, and if you click on these, they'll be associated with the Wine installation and run correctly. If not, find the location of the installed executable within the wine folder and continue to the filename with 'wine', just as we did with the installer.

The Wine project maintains a compatibility list so you can check to see if your app works first.



format. A high quality JPEG is a good option, but smaller images might be better suited to the PNG format.

Gimp is also capable of some advanced processing. The fuzzy select tool, for example, can be used to automatically select by colour, contrast and shape. And the clone tool is easier to use than the Adobe equivalent. Of course, you'll also find a library of effects hidden within the Filter menu, with our favourite being the Fractal Trace and GIMPpressionist.

DESIGN/PUBLISHING

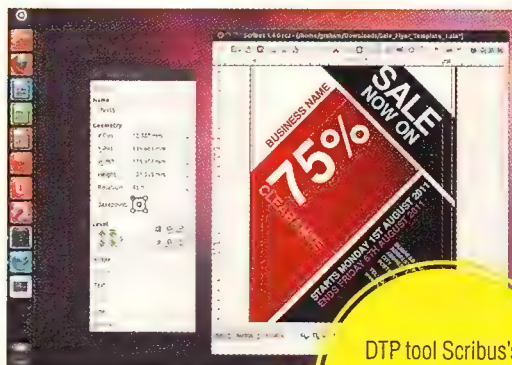
For company communiqués or even a more ambitious project, such as an internal magazine, there are two pieces of free software you need to use. The first is Inkscape, a vector graphics editor with a function-set similar to Adobe's Illustrator. It enables you to create and edit scalable graphics that look fantastic when printed. Like Gimp, you use a variety of drawing tools and layers to construct your masterpiece, before either saving it as an SVG or copying it to a different application.

The second is Scribus, a brilliant desktop publishing tool that generates far better output than trying to generate something from a word processor. Ubuntu repositories

list two versions of Scribus with the NG version being slightly more cutting-edge and perhaps unstable, but we've never had any problems with it. When launched, create a new document as a sheet of A4 (or whichever you need).

Scribus works in a similar way to many other DTP packages, you insert text and image frames as placeholders, then paste the contents from other packages to create the content. You can then move things around until they look right and view the layer palettes to adjust the properties for each item. You can then either send your project to the printer, or generate perfect .PDF files. All for around zero cost. **TOP**

DTP tool Scribus features compare favourably against paid-for alternatives.



WINDOWS

Calibrate your monitor

Henry Winchester shows you how to see your screen in a new light.

YOU'LL NEED THIS

A monitor in direct sunlight will be next to impossible to calibrate correctly, so make sure you put it in a suitable location first.



Monitors are notoriously tricky to set up properly. In fact, there's a whole section of the creative industry dedicated solely to getting monitors configured correctly so that photos, videos and web sites look as good as they possibly can.

Monitor calibration experts use expensive tools to measure light levels and contrast, but fortunately Windows includes its own monitor calibration program. Even for those completely new to it, using the program is fairly straightforward. But you'll need to familiarise yourself with the way your monitor works and how to access its settings.

The process is usually simple, but it's probably worth digging out your monitor's manual if you get lost among the controls and settings. All monitors are different, so here we've tried to keep our advice as general as possible.

The fiddling about should all feel worth it by the end, as having your screen set up correctly can make a big difference. You'll suddenly see photos and web pages in a whole new light – in some cases, quite literally!

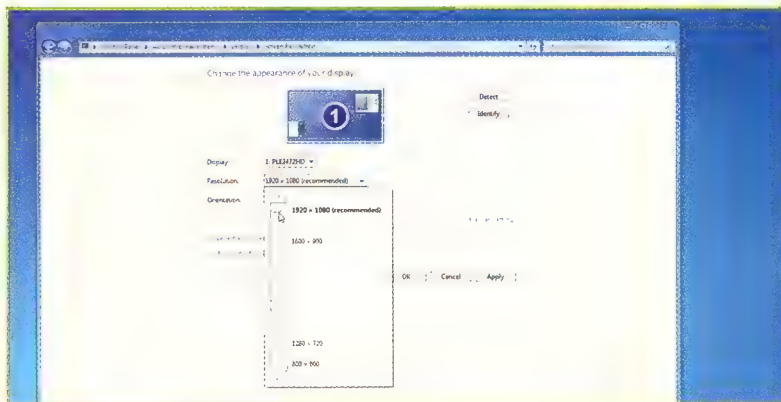
BRIGHTEN UP YOUR PC LIFE

Calibrate your screen to see words, images and film more clearly.



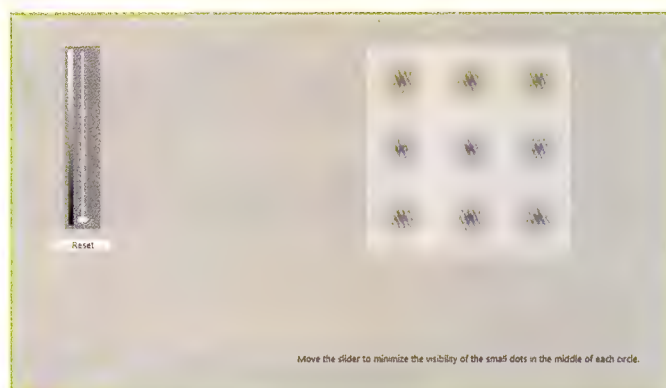
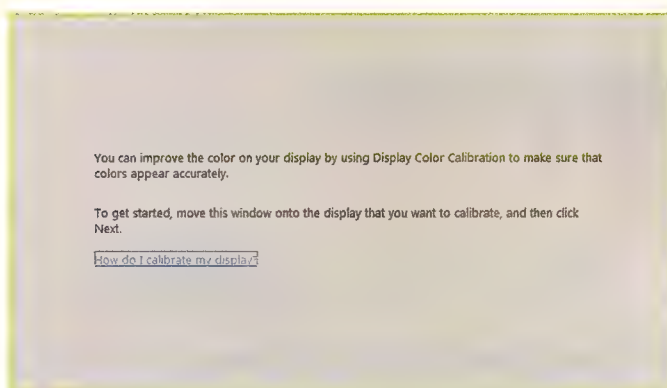
1 GET SET UP

It's important that your display is set up properly. Your monitor will include a series of buttons for adjustments, and pressing one of these (usually 'Menu', but sometimes 'Enter') will bring up a display on screen. This is navigated using arrow keys. If you can find a factory reset setting, it's a good idea to use it.



2 THE BASICS

Ensure your monitor is not in direct light and that you're sitting where you usually do. Monitors can sometimes lose colour if you look at them from an angle, so it's best to view it head-on. Right-click on an empty area of your desktop and then choose 'Personalize' followed by 'Display'. Then click 'Adjust resolution'.



3 NEW RESOLUTION

Set the Resolution slider to the highest value then click 'OK', then click 'Calibrate display' to launch the Windows calibration tool. If you have two monitors, drag the window onto the one you want to calibrate. If not, click 'Next' in the bottom right. When you've read the next screen, click 'Next'

4 GAMMA

Gamma controls the way bright and dark areas are perceived — it's distinct from brightness and contrast. Some new monitors come with gamma controls, but the settings can be altered in Windows. Click 'Next' to adjust — use the slider to the left to make the central circles as small as possible.

CALIBRATION TERMS

ClearType:

Windows' bespoke rendering system makes text legible and easy to read. Effects vary from person to person, hence its eyesight test-style calibration detailed in Step 9.

Colour:

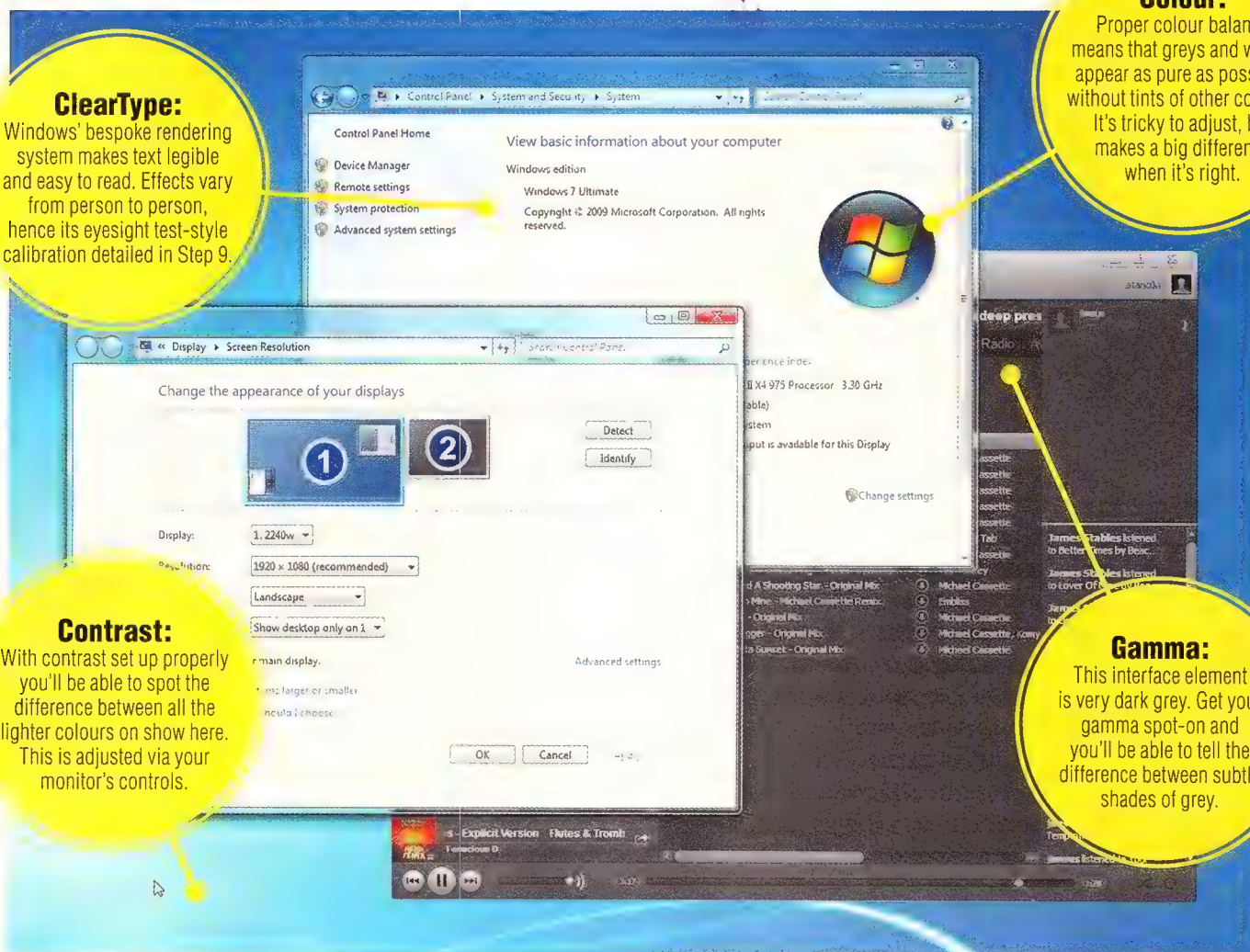
Proper colour balance means that greys and whites appear as pure as possible, without tints of other colours. It's tricky to adjust, but makes a big difference when it's right.

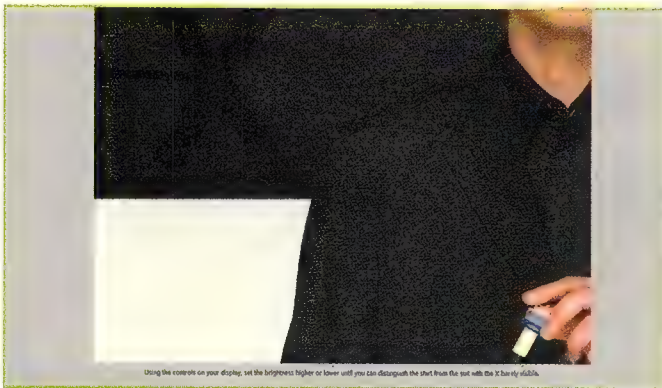
Contrast:

With contrast set up properly you'll be able to spot the difference between all the lighter colours on show here. This is adjusted via your monitor's controls.

Gamma:

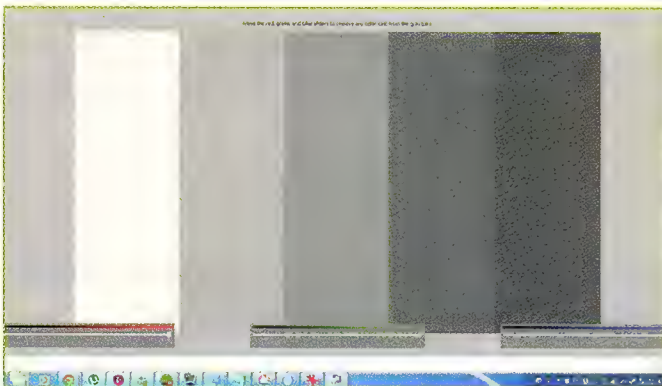
This interface element is very dark grey. Get your gamma spot-on and you'll be able to tell the difference between subtle shades of grey.





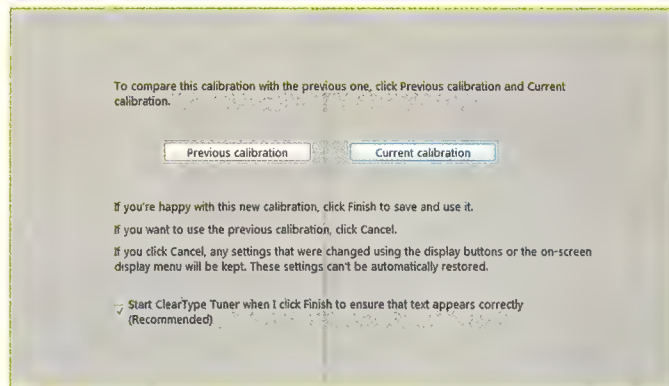
5 BRIGHTNESS

Click 'Next' for brightness and contrast. It's hard to get these spot-on, but calibrating them in Windows can make a big difference. Click 'Next' twice to begin. Turn your monitor's brightness all the way down, then work up until you can distinguish the man's shirt from his jacket, and just make out an X.



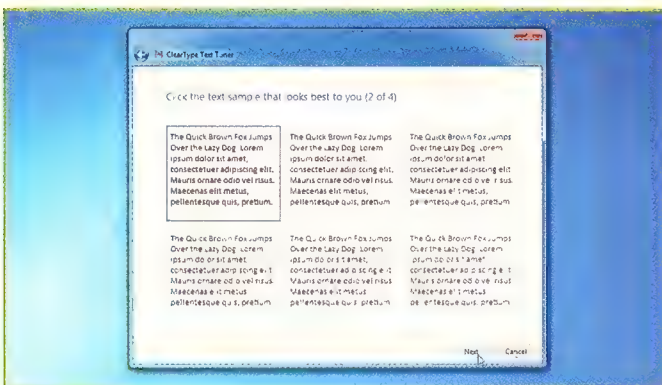
6 CONTRAST

If necessary, save the settings on your monitor, then click 'Next' two times to adjust the contrast. Use your monitor's settings to set the contrast as low as possible, then gradually work up until the buttons and creases on the shirt are just visible. Confirm the settings on your monitor, then click 'Next'.



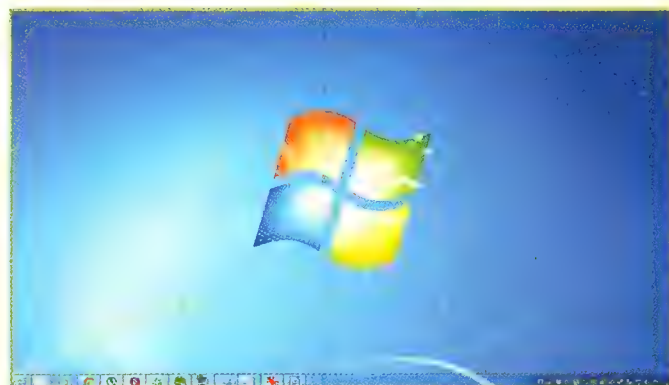
7 BALANCING ACT

You might want to call in another pair of eyes to help here. Colour casts can wash out your monitor with different hues, making colours look dingy, but Windows can be adjusted to compensate. Click 'Next' a couple of times, then use the sliders until the grey bars look as neutral as possible.



8 FINISHING MOVES

Click 'Next' to confirm your choices. You can now compare your calibration with Windows' original one. Ensure the box for 'Start ClearType Tuner' is ticked and click 'Finish' to save (or 'Cancel' if you're not happy). Bear in mind it can take a while for your eyes to adjust to the new calibration.



9 TUNE YOUR TEXT

Windows runs the ClearType Text Tuner, which ensures words on flat-panel displays are crisp and bright. Click 'Next' to begin. Choose the monitor, if necessary, and click 'Next'. The Tuner will present several pieces of text — pick the one that looks clearest, keep clicking 'Next' then 'Finish'.

10 FULLY CALIBRATED

You're now the owner of a freshly calibrated monitor. Visit some familiar web sites to see how much better they look. A properly set up monitor will make photo editing a doddle, and films and games will look crisp and vibrant. If you're not happy with it, run the calibrator again. **END**

WINDOWS

Manage all your open windows

Mark Wilson shows you how to stay in control with numerous programs on the go.

Despite all our good intentions to be neat and tidy, when we fire up our machines most people usually end up working with numerous programs and windows open at the same time. While there's nothing inherently wrong with this, it can quickly become confusing, slow your efficiency and make it more likely you'll lose a web page or simply forget what you were doing one minute ago.

However, help is at hand. The Aero Snap feature of Windows makes it easier to work with several windows at the same time, enabling you to quickly resize two programs or folders so they occupy half of the screen each.

WindowMenuPlus is a free program that expands

upon this idea, providing you with a range of options for managing multiple programs and windows you have open without any hassle.

For example, rather than minimising programs to buttons in the Taskbar, you can reduce them to icons in the notification area instead, which is handy.

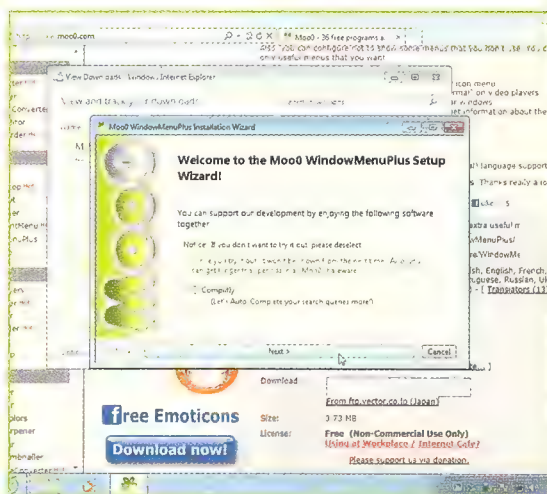
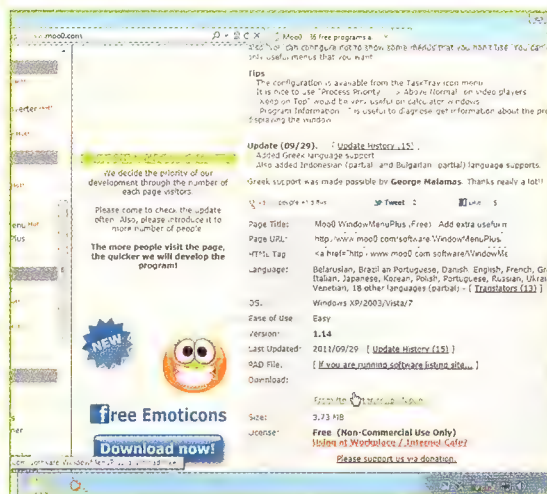
It's also possible to force a particular window to always appear on top of others, which is great if you want to ensure that a certain chat or browser window remains clearly visible while you're working on something else.

As well as those, there are even transparency options, and several quick ways to resize windows. Read on to find out more about this super-handy tool.

YOU'LL NEED THIS
This handy piece of software is a quick and free download from www.moo0.com.

TAKE CONTROL OF YOUR WINDOWS

Learn how WindowsMenuPlus can make your computer life easier.

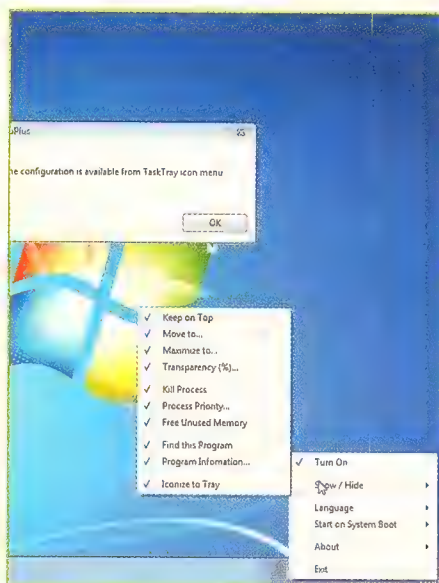


1 GET WINDOWMENUPLUS

Visit www.moo0.com and scroll down the left-hand side. In the Software List section, click 'WindowMenuPlus', then scroll down the right-hand side of the page and click the green 'Download' button. Click 'Save' in the bar at the bottom of the screen and click 'View downloads' when the download finishes.

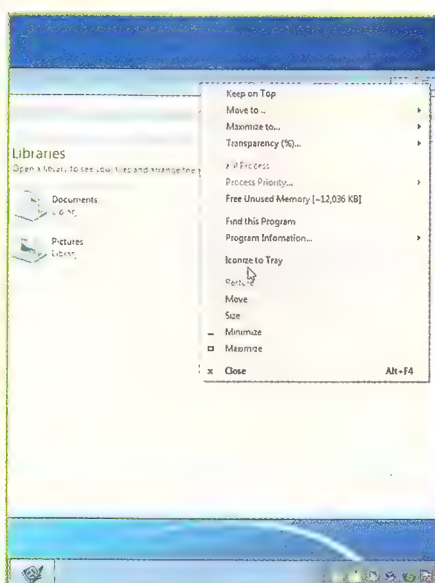
2 INSTALL THE SOFTWARE

Click the 'Run' button and confirm you'd like to run the software. You'll need to untick the box labelled 'Compitly' (this prevents the installation of a browser toolbar). Click 'Next', then tick the box to agree to the licence and click 'Next'. Click 'Next', leave all the boxes ticked and click 'Next' again, followed by 'Install'.



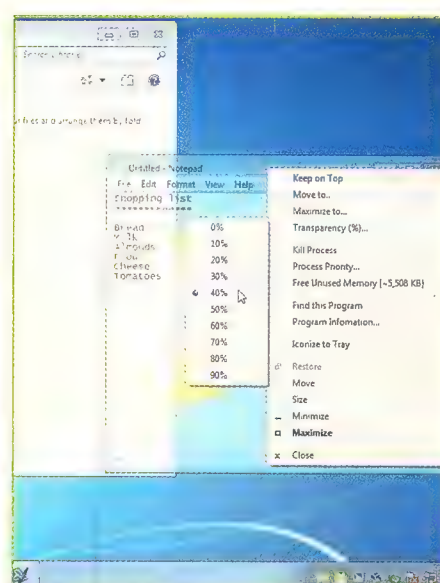
3 ENABLE THE PROGRAM

Ensure the 'Launch the application now' box is ticked and click 'Close' to get started. Click 'OK' to close the dialog that appears and then right-click the new notification area icon. Ensure the option labelled 'Turn on' is ticked and all the options in the Show/Hide submenu are also ticked.



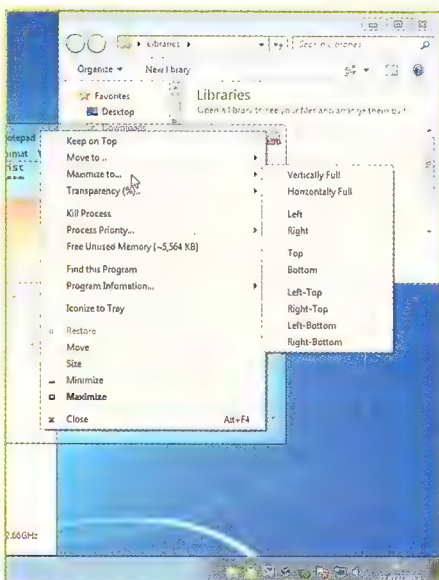
4 GET STARTED

To start using WindowMenuPlus, right-click the title bar of a running program or an open window. A large context menu will appear. Click 'Iconize to Tray' and the program or window will then be minimised to an icon in the notification area. Double-click the icon to restore your program or window to its previous size.



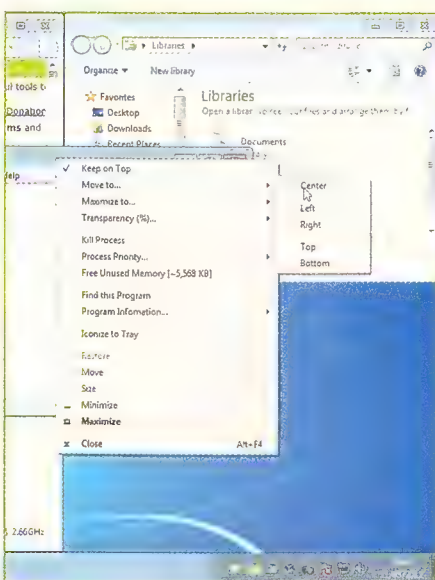
5 MAKE WINDOWS TRANSPARENT

If you want to see what's happening in the background, you can make a particular window slightly see-through. Right-click the title bar and select the 'Transparency (%)' option from the menu that appears. Now use the submenu to choose the level of transparency you'd like.



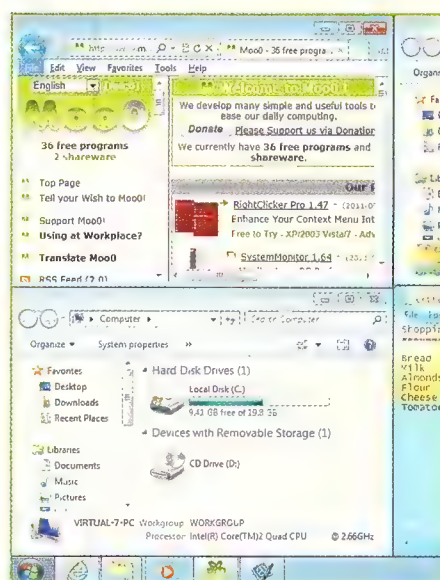
6 QUICKLY RESIZE WINDOWS

If you'd like to move a window to the bottom, top, left or right half of the screen, right-click its title bar and select the 'Maximize to' option. From the submenu, select the options to resize and move the window to a half or quarter of the screen, depending on what you'd prefer.



7 OTHER ARRANGEMENT OPTIONS

You can use WindowMenuPlus to move windows around quickly without resizing them. Right-click the title bar of a window or program, select 'Move to', followed by one of: centre, left, right, top or bottom. You can also click the 'Keep on top' option to prevent a window getting buried beneath others.



8 MANAGE YOUR WINDOWS

WindowMenuPlus gives you a number of different ways to keep on top of the various programs and windows you have open. Once you're familiar with how they work, you'll find they provide ways to manage your windows that are much easier to use and more convenient than standard options. **ATTC**



masterclass

STEP-BY-STEP TRAINING

IN THIS SERIES

We explain exactly what HTML5 is, its benefits and how you can put it to work for you with hands-on tutorials and templates. This 8-part series is written by expert programmers led by **Dr Rajesh Vasa**, lecturer at Swinburne University of Technology.

PART 1

Getting started with HTML5

In part 1 we start teaching you the fundamentals of the language on which the new generation internet is being built.

APC EXPERT

DR RAJESH VASA

Dr Rajesh Vasa is a programming guru who lectures at Melbourne's Swinburne University of Technology. Along with several other experts, he'll take you through this masterclass on HTML5.

NEON THREE

Specialist studio Neon Three focuses on web, mobile and user interaction design. The three members of the team — art director Scott McIntosh, lead programmer Toby Gall and lead designer Matthew Bruce — all have a passion for design and new technologies. Each brings a unique skill set to a project enabling a multidimensional approach to creative problem solving, hence why we've recruited them for this project.

HTML5 is a hot, emerging and trending technology. Many web developers have heard of it, some even use it. The general view is that HTML5 allows web developers to make attractive, powerful, maintainable and standards-compliant web pages.

So, what exactly is HTML5 and where did it come from? Are the commonly held views justified? In this masterclass series on HTML5, we'll deal with all of these issues and, more importantly, start to build small web sites that demonstrate the power of HTML5.

The best part is that you get to use the templates that we provide in your own projects for free, no strings attached. These templates look great because they're designed by Neon Three (www.neonthree.com) — an upcoming Melbourne-based design studio.

The templates are properly balanced and defined by serious designers (see Figure 1), and are easy to adjust to your own needs. The template provided (online) includes design for two different pages and offers a light and dark theme. We'll provide different templates along with each article in this series and use these templates to illustrate the constructs in HTML5 and associated technologies.

THE STORY OF HTML5

About a decade ago, a funny thing happened in the world wide web. The people on the W3C standards body (www.w3c.org) were busy sipping coffee and debating the minute detail of every HTML tag ever created or yet to be created. However, the engineers that build web browsers felt a bit disillusioned with the pace of W3C so they quietly got together, skipped thinking everything through to the atomic level, decided to agree on a few core principles, and defined a new

standard, WHATWG (www.whatwg.org), that would allow them to create the next generation of web browsers.

This new standard was created to respect the older HTML standards while offering a path to move forward. In short, while the politicians were debating, the engineers built next-gen standards and browsers, web developers used these new standards, and users of these new browsers (mainly Firefox, Opera and Safari) got the benefits. Google joined the party with its Chrome browser and started to aggressively support these new web standards — it even threw some of its own technologies into the mix. The story has a rather nice twist too. W3C, the original web standards body, took the work of WHATWG, added its own sauce, adopted a new logo and gave it a name — HTML5.

In case you are wondering if there's a difference between WHATWG and W3C standards, the answer is there are some subtle variations. However, WHATWG retains its engineering roots and tends to be a bit more informal with some experimental features thrown into the mix. In a way, WHATWG is aiming to invent the future rather than standardise the past. Thankfully, at a practical level, most modern browsers will cope with WHATWG or W3C standards. One more thing with HTML5 is that the colloquial use tends to group a bunch of related technologies together under this term. In particular, CSS3, web fonts, Javascript and extensions like micro-data.

Why bother with HTML5? The short version is that it involves less code, it's much easier to read (for both machines and humans), supports common interactions, allows us to create interactive graphics (which will be used and abused to create ads), we can store complex data locally, it offers full-duplex



Figure 1
The Dark and Light
templates designed by
Neon Three.

HTML5 SUPPORTS A LARGE RANGE OF DEVICES, ESPECIALLY SMARTPHONES AND TABLETS

communications over a socket and even offers audio and video functionality within the core of the specification. The standard also makes it easier to support a large range of devices, especially smartphones and tablets. HTML5 takes the last decade of compelling/useful web technologies and rolls it into one nice package.

WHAT EXACTLY IS HTML5?

HTML5 is an extension of the HTML standard that we've been using in browsers for the last 15 years. Broadly, we have three categories of extensions.

Structural semantics. HTML5 has additional tags and attributes to help mark up a page more precisely. In particular, these tags communicate intent better. For example, we have new tags like 'article' and 'figure'.

Extended semantics and functionality for forms. HTML5 has specific tags that will allow the browser to do common interactions like progress bars, input form validation, controlling the focus better.

Prior to HTML5, these features had to be provided via the use of Javascript or heavyweight plug-ins.

APIs allowing scripting access: HTML5 offers better control over audio and video. Additionally, we can declaratively create simple graphics and animations via the Canvas API. HTML5 also has APIs to store complex data locally (for example, for storing email for offline access). Additionally, there are APIs that permit better interaction between the browser and the server to make pages feel a lot more responsive.

Prior to HTML5, some of these extensions were available through a combination of Javascript, Flash and browser specific plug-ins (remember those ActiveX plug-ins?).

HTML5 standardises common interactions and semantics allowing us to create pages a lot more declaratively, rather than having to build Javascript functions, or make up special 'div' identifiers to describe the structure of a page. The best part is that our pages will work across a

range of devices as long as they have a standards compliant browser.

Thankfully, even Microsoft, which has a history of inconsistent standards support is slowly building browsers that are compliant with many HTML5 features. Unfortunately, not all browsers support HTML5 equally, nor do they support all of the standards as defined. Although this may seem troubling, the popular browsers currently offer support for the most commonly used HTML5 features.

If you're curious, check the level of HTML5 compatibility for your own browser at html5test.com. Our recommendation while you learn HTML5 is to use the latest version of Chrome. However, the latest versions of Firefox, Safari, or IE 10+ do offer adequate support for key HTML5 features.

Since we're targeting the near future of the web, the code snippets and samples we provide will assume you'll work with the Chrome browser as it currently supports most of the HTML5 features, yet is able

TABLE 1: THE TAGS AS INTENDED BY THE STANDARDS

Tag	Description
header	This tag should be used for a group of introductory or navigational aids. There can be one or more headers depending on how the page is organised.
section	A generic section of a document or application. A section, in this context, is a thematic grouping of content, typically with a heading.
nav	A navigational aid. Typically it will be an unordered list of links within the header section. However, there can be section specific navigation as well.
article	The article element represents a self-contained composition in a document, page, application or site and that is, in principle, independently distributable or reusable. For example, in syndication.
aside	Represents a part of the page that is tangentially related to the content. Ideal to mark up a sidebar of related content.
footer	A footer for a section of content. It can be for a section or a page. Typically used for the copyright, date and author information.

to support the older standards well. If you're creating web applications used internally within an organisation, then you should push for a change to HTML5. However, if the intent is to create a web page that works in older browsers, then you can use some of the HTML5 features by including certain Javascript libraries (this will be covered shortly), but there are many nice features that are just not available.

Enough of the overview. Now, let's get our feet wet. Please note before starting that this masterclass series assumes you have some familiarity with HTML/CSS and some of the general rules of web markup languages. If you're new to HTML or CSS, the pacing will feel a tad rushed but you'll still be able to enjoy the journey.

BASIC PAGE STRUCTURE

An HTML5 page looks deceptively similar to older HTML documents – in that there's a header section and a body, which the browser will render to the users. However, in HTML5, the amount of code you have to write is significantly easier to parse for both humans and the computer.

The code for a simple HTML5 page has the following general structure:

```
<!doctype html>
<html lang="en">
<head>
<meta charset="utf-8">
<title>HTML5 – Hello World!
<meta name="description" content="The first HTML5
article">
<meta name="author" content="Rajesh Vasa and Neon
Three">
<link rel="stylesheet" href="css/styles.css">
<!--[if lt IE 9]>
<script src="http://html5shiv.googlecode.com/svn/trunk/html5.js"></script>
<![endif]-->
</head>
```

```
<body>
<h1>Hello World! This is HTML5
</body>
```

Let's look at the above code listing in detail. The 'doctype' tag on the very first line specifies that this is an HTML document. In the older HTML and XHTML standard, this line contained a lot of other incarnations we really didn't need.

Thankfully, the new standard just stuck with a simple declaration. The next line indicates the language and opens the document. The header section specifies the character set for

this document and provides a title. The 'meta' tags are optional and we can provide as many as we need for our task. The next part states the CSS style sheet we want to use to define the visual presentation of the content.

The conditional selection embedded within the comment line provides a link to a Javascript file that will allow older browsers to process the new HTML5 elements and still render the content respectably. Although it's tempting to leave behind all those people that use IE 9 and below, this is not a practical option for most web developers (sadly, they have to service older browsers).

DEALING WITH OLDER BROWSERS

HTML5 includes a number of new elements, such as section and article, which we'll cover shortly. So, how will older browsers respond to these tags? Interestingly, many browsers (except IE 9 and below) don't care what tags you use. If you create your own one, like 'danger' and provide a CSS style for this tag, most browsers will just render it with the provided style.

You didn't read that wrong, go ahead and give it a go if you have an old non-IE browser lying around. So, what about IE 9 and below? Well, this is where 'HTML5 shiv' script (tinyurl.com/7cabqhb) comes in and allows older IE browsers to deal with the new HTML5 tags gracefully.

Figure 2
The page highlighted to show header, navigation, sections and footer elements.



One more thing that's new to HTML5 is that the 'script' tag is also very short compared in earlier variants. Previously, developers needed to specify additional details about the type of script – but in HTML5 it assumes Javascript to be default and hence we don't need to specify the type.

Another aspect that's worth mentioning is that you can move the script tag to the bottom of the web page to speed up the loading of the page. Although this wouldn't be recommended for scripts like 'HTML5 shiv' as you need it to process the new HTML5 tags, there are a number of other scripts where we can delay their loading until the rest of the content has been loaded.

Just to reiterate the main point, the rendering engine of a web browser (old and new) parses the HTML and typically will ignore tags it doesn't understand. Unfortunately, we'll have a problem if we start to make use of CSS and Javascript features that aren't supported by the browser.

For instance, if you attempt to use the border-radius feature supported only in newer browsers, then your page won't render properly on older browsers. So, go ahead and make use of the new HTML5 tags as much as possible to structure your content. We can adjust the level of styling (via CSS) and interactivity (via Javascript) based on the capability of the browsers – that is, we can respond as needed.

DEFINING PAGE STRUCTURE

One of the key features in HTML5 is its emphasis on the *semantics* of your content – i.e., the meaning of the content. In fact, it offers a number of new elements to mark up your content to match the structure of a typical web page. If you consider a normal web page, it will consist of one or more of the following:

- Header section with a logo and title.
- Navigation bar.
- Body content divided into one or more columns.
- Sections of content within the body columns.
- Footer section.

HTML5 offers specific elements to help us structure a page and they correspond very closely to the above list. The common elements are header, nav, section, footer and aside. Before HTML5, web developers needed to divide the page up (using 'div' tags) and then associate identifiers or classes to them.

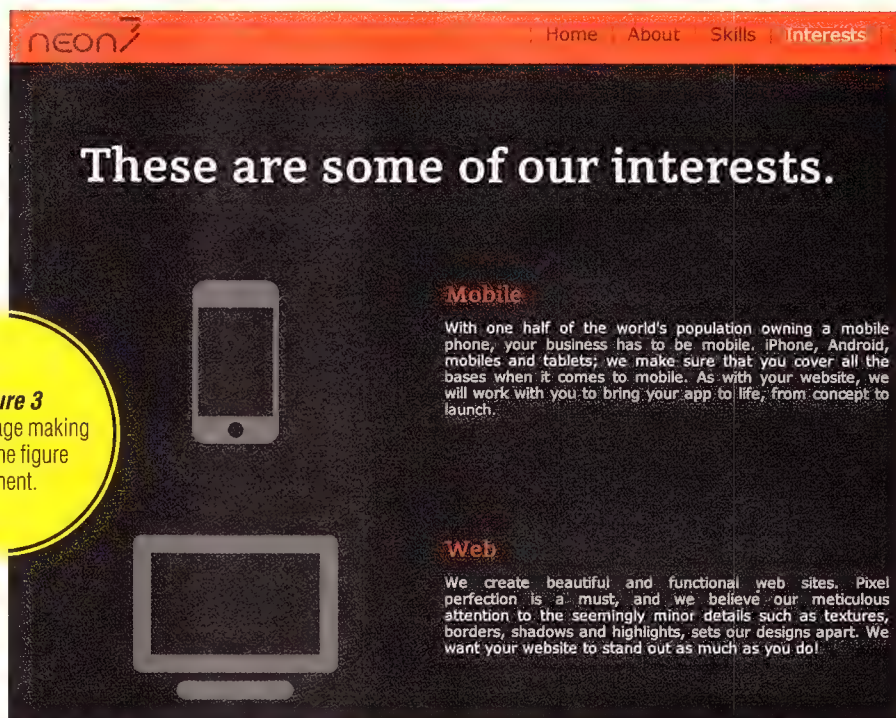


Figure 3
HTML5 page making use of the figure element.

For example, `<div id="header">`. In HTML5, these sections are wrapped within a header tag. The styling is still achieved via CSS like before, but these new tags communicate the intent of the content a lot better. Of course, it also offers a more standardised way to structure a web page and hence making a page easier to read and understand for other developers. So, what do these tags mean, and how should we use them? Table one on the page opposite describes the tags as intended by the standards.

The code fragments below show the power of semantic elements. The first listing shows how a header with navigation would have been structured prior to HTML5, while the second listing shows the additional clarity offered by HTML5. The semantic tags will reduce the 'div' tags that spread like wild fire on a web page.

As web developers adopt HTML5, it will improve maintenance, since developers don't have to invent minor variations on attribute names. For instance, the navigation will most likely be embedded in a 'nav' tag, rather than named with attributes such as navigation, nav, menu or other inventive names.

```
<div id="header">
    <div id="nav">
        ...
    </div>
</div>

<header>
```

```
<nav>
...
</nav>
```

```
</header>
```

PAGE STRUCTURE ILLUSTRATED

The page structure is easier to understand visually. Figure 2 highlights the content as marked up using HTML5 semantic elements for the sample template that is provided as part of this masterclass series. In particular we made use of the 'header', 'nav', 'section' and 'footer' elements. In Figure 2, sections and navigation area are shown as dotted lines, while the header and footer are shown with thicker lines. The styling for this page is provided in an external CSS which is explained shortly.

NAV, HEADER & FOOTER

The template has a clear header area where we place the navigation. The navigation is marked-up using a list (li tags), but placed within the nav tag. An interesting aspect in HTML5 is that the header tag can be used multiple times within a page. In fact, the specification states that we can use this element for headers within sections and articles. However, if the intention is to create a simple title, the more traditional tags like h1 or h2 will suffice.

FIGURES IN HTML5

One of the nicer inclusions in HTML5 is a way to deal with figures and associated captions

using two new elements – ‘figure’ and ‘figcaption’. The image itself still has to be linked in using the ‘img’ tag. The advantage of using the figure element is that we can wrap multiple images and create a single caption. Furthermore, we can assign an ID to the figure element and use that as an anchor allowing us to refer to this figure from any other HTML document.

We illustrate the use of the figure element in the interests page of the template (see Figure 3), and the following code snippet illustrates the use of the figure element to encapsulate two images and associate a caption for them.

```
<figure id="figure12">
  
  
  <figcaption>Figure caption goes here/<
figcaption>
</figure>
```

STYLING THE PAGE

The golden rule of web development is that all content should be marked up semantically in HTML, and the styling (i.e. look and formatting) should be achieved using CSS. If your CSS knowledge is a bit rusty, here's a short summary.

CSS stands for Cascading Style Sheets and it's used to provide the look for any element in the HTML document. Typically, we can specify the layout, colour and font to use for any element in the HTML document. The real advantage of CSS is that it allows the same content (HTML) to be formatted differently if required. For example, we can style a page for print, for smartphone or for desktop.

CSS is an evolving standard, however within the context of HTML5, CSS3 is considered the version that offers the most flexibility and shows where the near future lies. Browser support for CSS3 is similar to HTML5 with current versions of Chrome, Firefox, Safari and IE 10+ offering decent support for many of the features in CSS3.

We can specify the styles for any element from the HTML document using CSS. For example, the following code listing shows the general style rule for the body and the navigation menu within the HTML document that refers to these rules (these are style rules from the template provided).

CSS standard also specifies the order (priority) in which style rules apply if more than one rule matches

against a specific element. For instance, in the code listing below, the style rules for the ‘nav’ will include the rules specified for the parent body element. However, the colour for the ‘ul’ element will have a higher priority than the one specified for the body. The exact method used to cascade these rules is specified in the CSS standards.

```
body {
  font-family: Verdana, Geneva, sans-serif;
  color: #e6e6e6;
  background: #111111;
}
nav {
  width: auto;
  float: right;
  font-size: 20px;
}
nav ul {
  margin-top: 15px;
  color: #a4371c;
}
```

We can also specify styles for elements that have been tagged either with an ID or a class attribute. For example, the ‘div’ with identifier logo is styled as shown in the code listing below.

```
#logo {
  float: left;
  height: auto;
  width: auto;
  margin-top: 10px;
}
```

CSS is a powerful styling language. In fact, if you're creative, CSS will even allow you to display complex geometric shapes (see Figure 4, below). Of course, ideally

you should use vector graphic images (SVG) for geometric shapes, but CSS is quite capable and these shapes should render fine even in a recent version of IE.

The key concept underpinning CSS is that it relies on a box model. It treats every element in the HTML page as a box with a width, height, margin, a border and padding.

To get the desired style, in the CSS we define where each box should be positioned and how it should be styled. The browser reads the HTML and then uses these CSS rules to place these boxes in a certain order. In fact, we can place these boxes next to each other, or under each other, or even overlap the boxes. We can make some, or all, of the box transparent, we can set font colour and background and foreground colour as well. If you ever get stuck with CSS, just remember that all you are dealing with is boxes.

If you haven't used CSS extensively before, then a good practice is to apply styles incrementally. This process is illustrated in Figure 5 (opposite). Start with the raw content, first add margins and define the key chunks on the page. After this, add colour and adjust the fonts, and in the final step position all elements on the page. This particular process is also illustrated as a video you'll find at apcmag.com/html5.

OBTAINING & CUSTOMISING THE TEMPLATE

The template offered as part of this HTML5 masterclass is designed to help you to create a simple personal home page. You can customise the template with your own content and include links to your social network, show recent tweets as well as publish a few photos.

Shapes using nothing but CSS

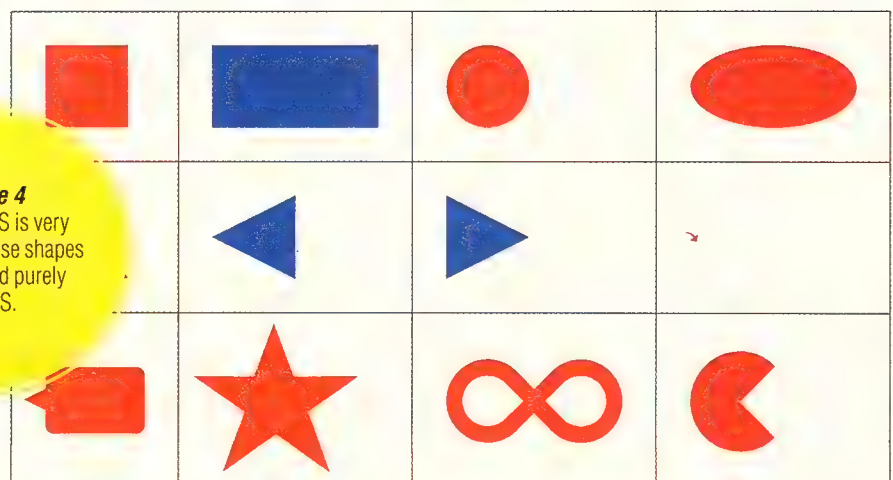


Figure 4
Modern CSS is very powerful. These shapes were created purely in CSS.

The source code is available on Github freely for you to download and use. To get the template, navigate to github.com/neonthree/html5 and you can clone the repository or view the source files in a web browser.

The source code is structured using a typical folder structure. The style sheets are in the CSS folder while the shared Javascript files are all placed in js folder.

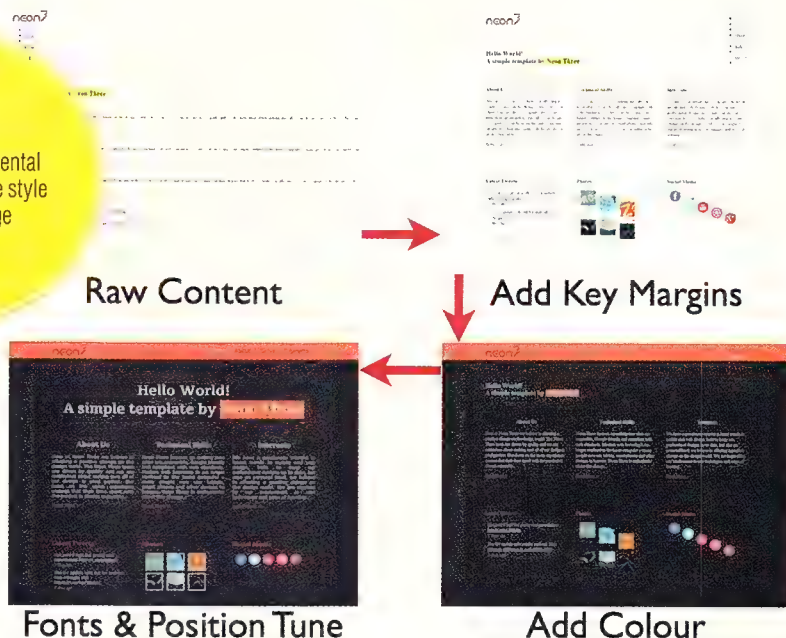
The sub-pages in the site are all placed in the pages folder. The template provided contains both a dark theme (index.html and style.css), as well as a light theme (indexlight.html and light.css).

In order to use the template, you'll need to change the content, create new pages and adjust the navigation bar to point to your own pages. Since the template assumes a site served statically from a web server, you'll have to provide the navigation bar for each and every page you create.

The one change you'll need to make is to set the currently active page using the CSS class active within the nav tag. If you work better by looking at examples, see the navigation links in the main page and the interests page in the template and mimic that pattern.

The template we've provided for you is currently wired up to show two recent tweets, a few recent photos and also links to your social media. However, the current configuration points everything to Neon Three's social network feeds. You'll have to adjust the code to point it to your own content.

Figure 5
Steps to incremental refinement of the style of a web page



Twitter can be customised by providing your own Twitter name at the top of the twitter.js file. In Line 4, set the username to your own Twitter Identifier. The script also allows you to configure the number of recent tweets you want shown. We've set it up to show the last two tweets as that fits nicely on the template. If you want to adjust these, then change the number of tweets on Line 5 of the script.

The template reads the photos from the images folder. Place your own photos in the images folder and adjust the links in index.html in the footer section. You can provide your own 6 photos here and either

link to an external online source like Flickr, or to a local image file.

We've provided you with icons for the top social media sites as well in our template. Within the footer section of the index.html page, adjust the URLs to point to your own social network feeds.

Just a note of warning – since the site is statically created you will have to make the changes to the footer/header section in all pages you create for your own site. We hope you enjoyed the overview of HTML5. Next time, we'll return with a new template and look at other features in HTML5. **BTTC**

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masterclass

STEP-BY-STEP TRAINING

IN THIS SERIES

This masterclass covers everything you need to know about editing and manipulating sound for music production, listening enjoyment and video. In this article, we provide an introduction to the masterclass and some fundamental sound concepts.

PART 1

Introduction to digital sound

In our first audio masterclass we'll cover some basic terms.

APC EXPERT

MIKE LE VOI

Mike is an IT professional with a background in virtualisation, but his lifelong passion is digital sound. He records and produces sound for a variety of clients and will take APC readers through the fundamentals of sound in digital production.

Why a masterclass on audio? You might think that unless you're a musician or a podcaster, you'll never really have to deal with the creation of purely digital sounds. But the reality is that with increasingly multimedia-rich presentations and web sites, the growth of apps and the rise of the home movie auteur, getting the sound right is enormously important.

While this masterclass – which will run over six episodes – won't turn you into a sound engineer, by the end you should feel a lot more confident about how to turn out excellent sound for your projects. We'll explain everything from how digital sound works and how to record it (covering everything from the right equipment to understanding recording levels), to how to edit audio and fix bad recordings, and we'll finish off on how to ensure you get the best sound for your movies. So let's introduce some definitions.

SOUND FORMATS

To record an analogue sound wave and store it digitally, we need to sample the waveform many times a second and store each value as one or more bytes. Sound can be stored in many digital formats under Windows. The most common is the WAV format (Linear PCM). When an audio CD is ripped under Windows, the original CD data is normally copied, byte for byte, to .WAV files. The attributes of a .WAV file, which are important for storage size and quality, are the number of channels, the sampling frequency and the bit rate per sample. The audio CD and most sound files have two channels. Now that surround sound is common, we typically see six or eight channels of audio on DVD and Blu-ray discs.

SAMPLE RATE

Early digital recorders used to record audio on video tape, which allowed recording with a sampling

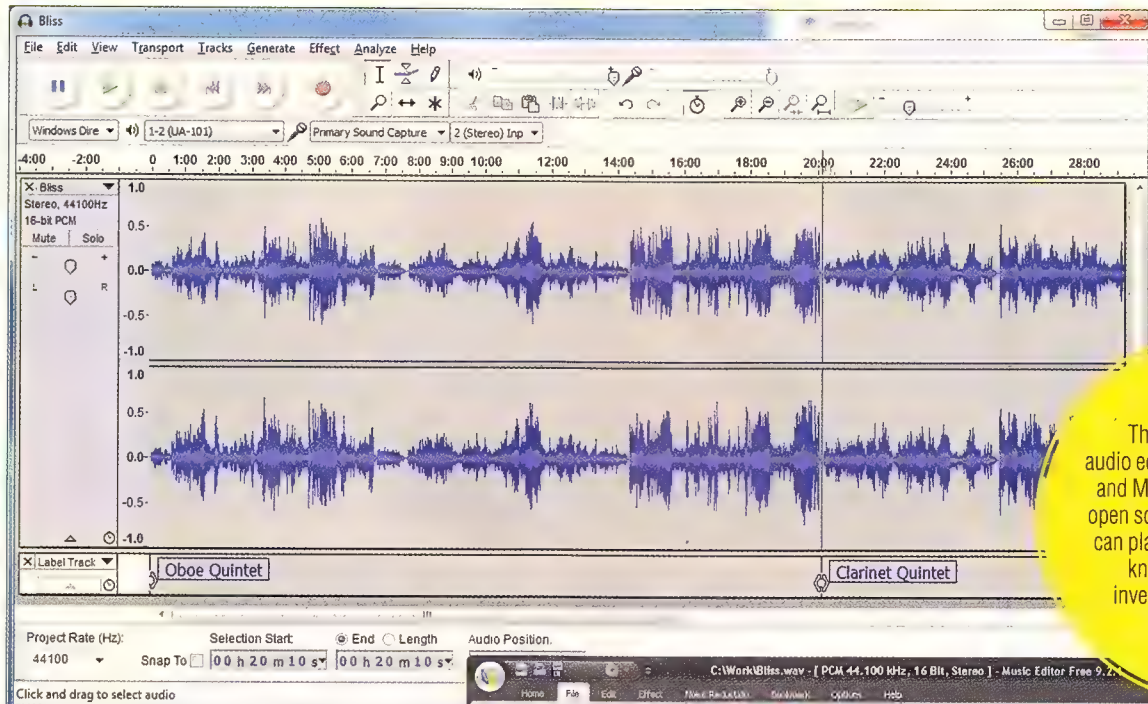
frequency rate of 44.1kHz (44,100 times per second). Professional Digital Audio Tape (DAT) recorders stored the sound information with a sampling frequency rate of 48kHz (48,000 times per second). The 44.1kHz standard was adopted for CD audio. Nowadays it's also common to see sampling frequencies of 32kHz, as well as 96kHz for modern, professional recording equipment.

The choice of which sampling frequency to use is quite easy to make. The human ear can generally hear frequencies from 20Hz to 20kHz, although the ear loses the ability to hear higher frequencies with age. It's common for the upper frequency heard by older people to be reduced to 12kHz or lower. Without going into the science of this, it turns out that to store a 20kHz waveform, you need to sample the waveform at twice this rate. When you take into account aliasing and other effects, you need to sample at slightly higher rates.

Physical limitations of video tape meant that a 44.1kHz sampling rate was chosen, which is high enough to store the information at about 20kHz of sound. 32kHz only allows frequencies up to about 15kHz. This is less than optimal for music, but is plenty for speech or background sound.

BIT RATE

Each audio sample is stored in one or more bytes of data. 8-bit audio sounds quite unpleasant. It has a lot of 'hiss' as 1 byte of data cannot contain enough information about the relative levels of a sound wave. 16-bit audio was decided upon for CD audio as this produced a pleasant experience and allowed a theoretical dynamic range (soft to loud) of 96dB. 24-bit recording allows up to 145dB. The human ear can detect a dynamic range of about 120dB. Having said this, the average dynamic range for a concert hall recording is normally 60dB or less. Pop music has a much lower dynamic range.



There are many digital audio editors out there. Audacity and Music Editor Free are two open source, free programs you can play around with once you know the basics. We'll investigate them in-depth in the next issue.

AUDIO QUALITY & DATA STORAGE

Many 'double blind' tests have been conducted by volunteers around the world. Most people can detect a bit rate less than 10. Most people cannot detect the difference between 16-bit and 24-bit audio. Similarly, some people can detect the difference between 32kHz and 44.1kHz recordings. Arguably, some people can detect the difference between 44.1kHz and 48kHz or 96kHz recordings. For all intents and purposes, 16-bit, 44.1kHz is simply 'good enough' for almost everyone.

The higher the bit rate and sampling frequency, the larger the sound file. CD audio uses 1411.2Kbps, which is roughly 10MB of data per minute of music. Stereo, 24-bit 96kHz recordings use about 34MB per minute of music.

When hard disks were small and storage was at a premium, this meant that compressed audio files such as .MP3 were king. An .MP3 uses psychoacoustic information to compress a CD file down by up to 10:1. Now that hard disks are huge, there's no need to use less than 16-bit 44.1kHz for your 'master' recordings. You use lossy compression for formats such as MP3 only to play your music in a car or on a device such as an iPod.

RECORDING SOUND

When you're recording sound for later production, do recording levels and bit rates really matter all that much? Well,

yes and no. If you record at low bit rates and very low levels, you'll hear 'hiss' when you play back the file at normal listening levels. For this reason, we used to try to maximise the sound level of the recording when using 16-bit recorders.

However, now that we can easily record at 24-bits with a good sound module, there's no reason to try to maximise the recording levels during the recording session. You set the levels so the sound never overloads the recorder and peaks between -10dB and 0dB if you can. If it doesn't go above -20dB, don't worry too much because you'll probably use compression and other techniques to reduce the dynamic range to 50dB or less for the final, mastered recording anyway.

For a produced video, if the sound is mainly background or speech, you could economise on data storage and master the final soundtrack down to 16-bit 32kHz, as discussed previously. However, if you do the calculations, the amount of data

allocated to the audio portion of a video file is normally a lot less than the amount of data allocated to, say, the video portion of a High Definition video file. Also, a lot of video files contain MP3 or other compressed formats for the soundtrack. Most people can't detect the difference between CD audio and MP3 audio at 320Kbps – roughly a 4:1 compression.

If you plan to use compressed audio for the soundtrack, then you may as well stick with 44.1kHz or 48kHz audio. Bear in mind that the 'video standard' for sound is 48kHz, rather than 44.1 KHz. If your video recorder uses 48kHz, then it's best to stick with that.

So, now we've completed the introduction masterclass, we'll look forward to part 2 next month (APC September). You'll discover that the series really gets going and will be allocated more space so we can have a good look at the basic tools you'll need to work with sound, including a variety of sound editors, from free to professional ones. [APC](#)

120 games

HIGH-PERFORMANCE PLAYTIME



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In the extensive — and intensive — research of three and a half minutes on Google, we couldn't find a name for a genuine cable phobia, which lends undeniable weight to my argument that there's absolutely no compelling reason for wireless gaming headsets.

I mean, where do you plan on playing that a cable won't reach? But if you insist on being untethered (read taking a bio while still listening to the *Skyrim* soundtrack) then the V2000s might be for you.

The headset features a unidirectional boom mic on the left can, a response range of 20 — 20k Hertz, a battery life of 10hr and a range of 12 metres, though we managed almost twice that as long as we maintained line of sight with the USB transmitter.

The 50mm drivers do a decent enough job but we think wireless headsets can't compete with their tied-down brethren. In the comfort stakes, out of the box the V2000s headband is supple enough and eager to please, but our watermelon-sized head felt the pinch only a couple of hours into game time. At the asking price, they're not too bad a value proposition, but for true lovers of sound, there are far better tethered options.



Star Wars 1313
Pew, pew, pew...

The very, very (very) best of E3

Sun, booze, crack whores and gaming.
We must be in L.A...

Dishonored
That's not a kni...
oh crap, yes it is!

I'm still recovering from the gaming, jet lag, whisky and greasy bacon-induced hangover that is the greatest gaming show on Earth — E3, although my shadow is still making way too much noise.

I've sifted through the tomes of notes, scratchings and hyperbole-riddled announcements to present the top five games pimped at the show. Sadly, booth babes didn't make the list — we're a little more refined and highbrow...

NEED FOR SPEED: MOST WANTED

● www.needforspeed.com
? October 30 2012

This is the second NFS for Criterion and from what we saw during our hands-on time they've absolutely nailed it. The fact that no-one, ever, gives any thought to a storyline in the NFS games has finally sunk in; instead, the business model has turned to all multiplayer, all the time.

Remember Autolog in the last couple of games, basically a built-in leaderboard for everyone on your friends list? That sums up *Most Wanted*. Massive open-world racing. 'Jack spots' to boost high-end cars, longest jump competitions, speed zones and 12-player point-to-point races are only a few of the events on offer

through a vast stunning city. I'm gonna need more friends, wait, some friends. We were genuinely surprised at how good this game's looking. Start saving now, October 30 is just around the corner.

STAR WARS 1313

● www.starwars1313.com
? TBA

I know what you're thinking: groan, yet another soulless, husk of a game hamfistedly mashed into the Star Wars universe. But 1313 has reignited our excitement for the franchise, thanks going largely to the skill sets and tech used.

Full performance capture (acting, face and voice captured on one take), jaw-dropping CG and a swag of new techniques developed by teams from across Lucas Arts — most having never worked on video games before — bring this 'cinematic playable

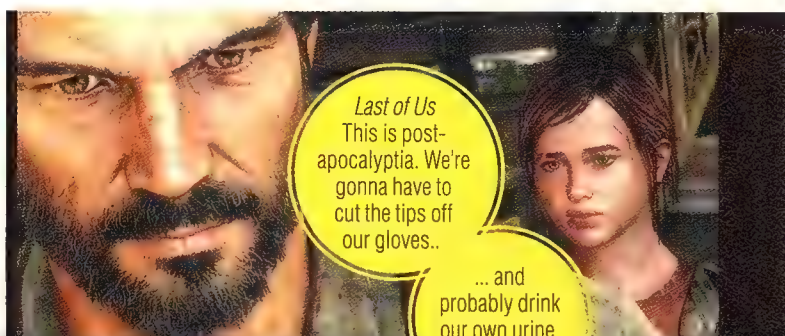
adventure' geared toward mature audiences (and bounty hunters) to life. The build we saw was running like silk at 30fps on current-gen off the shelf Nvidia gear... we just weren't told how much of it!

There's no word yet if 1313 will make an appearance on consoles. It's still early days for the dev team so I'll hazard a guess at no, at least not for our current generation of console hardware.

DISHONORED

● www.dishonored.com
? October 2012

We had no idea what to expect as Arkane Studios co-creative director Harvey Smith took us through the presentation of Bethesda's upcoming FPS action/stealth game. The easiest way we can think to explain the game is 'optional dismemberment'. The protagonist is Corvo Attano,



Last of Us
This is post-apocalypcia. We're gonna have to cut the tips off our gloves...

...and probably drink our own urine. Bottoms up!

HALO 4
It's good to
see you again,
basketball
face.

a shamed ex-bodyguard-to-the-Empress, seeking vengeance for being wronged.

We got to see the Golden Cat level set at the local bathhouse. Missions are set up similarly to *Deus Ex* in that there's no one or right way to approach them. In the first playthrough, Corvo took a stealthy approach, killing no-one and relying mostly on his ability to pause time and teleport (we mentioned these guys made *BioShock 2* right? Expect the supernatural).

The second playthrough was a different matter, with Harvey promising everyone would be killed. He just didn't mention it would be so brutal. It seems every weapon available is geared toward dismemberment as heads were literally rolled, picked up and thrown as distraction.

Complimenting the brutality are grenades called Spring Razors – a ball of coiled wire – that explode upward, slicing bodies as they go. If that's not all, Corvo can also summon a pack of rats to more or less distract, and eat, the enemy. *Dishonored* will be available Down

Under for the PC, PS3 and Xbox 360 in October this year. I'm already having nightmares.

THE LAST OF US

@ www.lastofus.com
? TBA 2013

The future really is a horrible place; well at least the broken future that games have been feeding us lately. There are more than enough food and ammo-scrounging resource games with angry, scared people that we need to question if there's room in the market for another.

The simple answer... hell yes! Looking and feeling a little like *I Am Alive* but with a million percent more colour and fidelity, LoU focuses on the protagonist's bond with his travelling partner rather than being a simple fight for survival, through resource management. From the opening scene I was assaulted with feelings of nervous insecurity, fright and uncertainty (ick feelings) and sucked right into the game before we'd even met any other people.

When that inevitable encounter came, gripped by feelings, fighting for survival became angry and

desperate. Again, similar to *I Am Alive*, *Last of Us* features a 'balance and power' combat setup where intimidation and control are just as deciding to combat as actually unloading rounds.

It seems to have its share of scripted encounters, but we're promised that the AI is adaptive and compensations are in place for alternate approaches.

HALO 4

@ halo.xbox.com/halo4
? November 2012

Please don't throw rotten fruit just yet – the first post-Bungie *HALO* is almost upon us, and guess what? It's exciting! Instead of merely re-polishing the proverbial and shipping it to market with a clever slogan, 343 Industries has looked at and re-evaluated every aspect of the game to determine what they need to add to the universe to shape the future of the franchise.

HALO 4 won't be a finite experience. Once you've beaten the main campaign, Spartan Ops, 343's version of episodic content kicks into gear. Basically like a TV show you can play, there'll be new content weekly for players to bite into – a couple of hours to each episode that will significantly tie in with the main campaign.

The mundane competitive multiplayer has also had a revamp and feels snappier and more fun and responsive. *HALO 4* is shaping up to be a significant contender.

Troy Coleman

BAND TOGETHER

@ tinyurl.com/7rw2vo3
\$ \$2.99

A weird, sadistic blend between *Lemmings* and *Paper Monsters*, *Band Together* may not be the freshest of ideas, but gameplay is so much fun it's difficult to pass over.

The learning curve is quite shallow, thanks to simple and intuitive controls and you'll have your 'Bandis' heading out the level exit door in no time; as long as you can steer clear of the devastating traps.

As dark as it sounds, it's not a tremendously violent game and should be no worries for the kids to have some fun with. *Band Together* is only available on the iPad 2 and the new iPad.

TC

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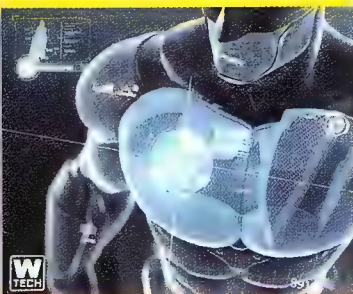


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BATMAN: ARKHAM CITY – ARMORED EDITION

@ Wii U

Dec 2012

It may be old now, but on the slim chance you haven't played it yet it might be worth holding off until the Wii U drops because it's looking pretty tasty.

We got some hands-on time with the new version and the asymmetrical gameplay (something different happening on the controller screen and the TV) of the Wii U really adds a little more of that 'I'm the Dark Knight and I'm getting all Detective on this crime scene' feeling. Of course, spoken with more gravel in the throat than I can muster.

All of the game's maps, inventory, Detective Mode scanning and gadget management/application and control are shifted down to the smaller touchscreen.

The controller basically becomes one of Batman's gadgets. It feels a little strange at first, continually looking down from the screen, but once you get the hang of it going back to a standard control scheme feels kind of boring.

Another plus is that because you're constantly readjusting your focal length, you'll never have to take a break from gaming again*.

*We accept no responsibility if your eyes melt due to persistent gaming.

TC



Lollipop Chainsaw

Chop 'til you drop.

lollipopchainsaw.com \$79.95

Lollipop Chainsaw's hero – that's you – is Juliet Starling, a prototypical US cheerleader who also happens to be a fearless chainsaw-wielding zombie hunter. Also, her boyfriend's severed-yet-still-alive head is affixed to the back of her miniskirt. It's probably best you don't ask why; this is a game with both a very dark sense of humour and a full realisation that it's clichéd and exploitative, and it's not afraid to play that for laughs. The script (by James Gunn, who got his start working at Troma – and, for better or worse, it shows) is genuinely funny in places, and riffs on about every pop culture cliché you'd care to name, including gaming.

Underneath what passes for the plot there's a basic score attack beat-em-up (chop-em-up, really) game. There are plenty of combos to go around, although gameplay isn't flawless, and you'll sometimes find yourself pinned in corners or frustrated by the camera. It's also only got a running time of around six hours. In some ways that's a good thing – it'd lose its appeal if it had to come up with more humorous scenarios for much longer – but it's also a concern on the value front, even with the lure of chasing higher scores and unlocking the game's 'good' ending.

Combat is broken up with mini-games, some of which are OK, and some of which are pretty tedious; thankfully again, none of them are terribly long. *Lollipop Chainsaw* delivers what it says – Lollipops, lots of sparkle (as the game itself explains, the sparkles are 'because of the awesome!') and plenty of severed zombie innards, but many gamers will saw through it in a weekend and not really wish to return.

Alex Kidman

- ✓ Plenty of attacks, well written and humorous script.
- ✗ Choppy combat and camera, humour loses its value in repetition.

7
10

Max Payne 3

Putting the fun back into substance abuse.

tinyurl.com/6uhom9z

\$99 consoles, \$68 PC

It's nine years after the events of the second game. Max is retired and focusing all his energy into drinking and self-destruction. A bar fight and a chance encounter with his old friend Raul Passos see Max heading to Sao Paulo to work security for the rich and entitled until the boss's daughter is kidnapped by a street gang. Half sozzled and completely out of control, Max heads out for a rescue.

The over-the-shoulder – and over the top – noir-style graphic novel formula the series is renowned for hasn't changed from the second game and players should expect Max to get his hands very dirty as he slow-mo blasts his way through the environments with an almost ever-present running commentary.

It's action packed, fun and looks gorgeous, especially the fluid character animations. Dan Houser's *GTA IV* and *Red Dead Redemption* writing of Max as a character is simply wonderful. The man knows how to craft a lovable, extremely fallible rogue. From the opening scene we were mesmerised by this balding, paunched, husk of a man, eyes glued to the screen like we're witnessing some abhorrent atrocity and can't bear to look away. We left the house and cuddled the first dishevelled, whisky-soaked hobo we could find just to lend some physicality to our feelings.

But for all the sensational writing and fast-paced action gunplay the game does so well, sometimes it just gets it wrong. And the blame sits squarely on the shoulders of the difficulty tuning and the game's absurdly extreme linearity. At times the gunplay can feel a little bland as Max slows time to shoot guys then rinse/repeats through to the end game. There's also an issue with the game's progression, where on more than one occasion a sudden spike in difficulty meant we were reloading the section repeatedly just to try and get by. That brand of practised success really breaks immersion and winds up messing with the overall pacing. It's not necessary to have played the previous games or have a deep knowledge of his history. *Max Payne 3* is a must.

Troy Coleman

- ✓ Beautiful character writing, lengthy campaign, looks fantastic, sexy character animation.
- ✗ Difficulty bottlenecks, some pacing issues.

8
10

THE BLEDISLOE CUP



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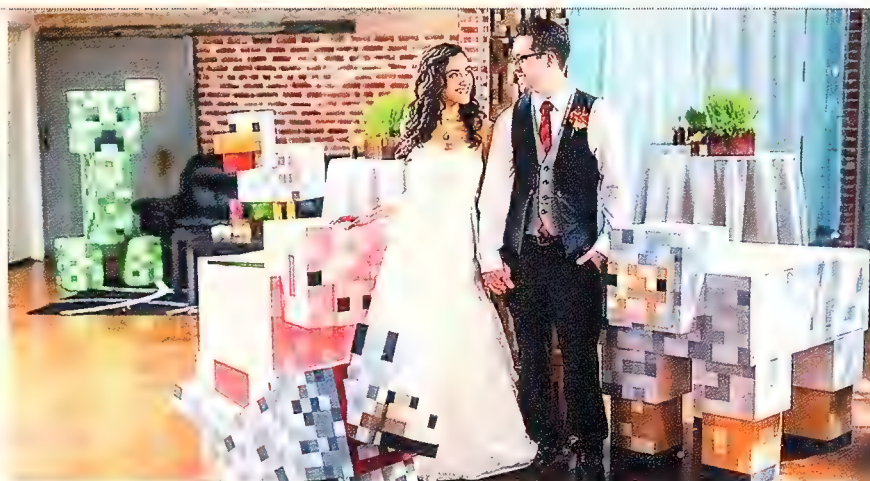
NEW ELEMENTS ON THE TABLE

Recently two new elements were officially added to the periodic table. The elements – numbers 114 and 116 – are known as flerovium and livermorium, respectively. The two heaviest elements on the periodic table – with atomic masses of 289 for flerovium and 292 for livermorium – both elements are highly radioactive and thus very unstable. They were created by several different teams around three years ago, with proof of their existence being accepted by the governing bodies of both chemistry and physics in June, 2011.

The name flerovium (atomic symbol Fl) was chosen to honour Flerov Laboratory of Nuclear Reactions, where superheavy elements, including element 114, were synthesised, while the name livermorium (atomic symbol Lv) was chosen to honour Lawrence Livermore National Laboratory (LLNL) and the city of Livermore, California, where the synthesis of superheavy elements, including element 116, occurred.

Creating elements 116 and 114 involved smashing calcium ions (with 20 protons each) into a curium target (96 protons) to create

element 116, which decayed almost immediately into element 114. Element 114 was also separately created by replacing curium with a plutonium target (94 protons).



MINECRAFT WEDDING CRAFTS LIFELONG BONDS

I love it when geeks marry geeks and have geeky weddings. Matt and Asia bonded over their love of Minecraft, so, after Matt proposed on stage at MineCon (tinyurl.com/6wtjbo7) they decided to make it their wedding theme. As you can see, the reception was peppered with Minecraft

mobs, such as Pig, Dog, Sheep, Chicken, and – although I don't know if I'd want him at my wedding – Creeper. For that extra touch, the drinks were Minecraft themed, featuring labels designed by Mojang's own art developer, Junkboy. Let's hope they craft a love stronger than a diamond pickaxe.

BIG PINEAPPLES IN LITTLE CHINA

Diablo III is a pretty popular worldwide game. China, though, does it a little differently. Y'see, if you want to sell any form of cultural product from outside of China, the Ministry of Culture has to approve it. This can significantly delay the release of a game. With so many fans desperate to play it at the same time as the rest of the world, this creates a market ready to be tapped by anyone bold enough to go against the Ministry. So, how do you sell something technically illegal in a country known for its tough internet monitoring? You give it an alias! Instead of listing it under its official Chinese name, *Dark God of Destruction*, cheeky Taobao sellers listed it as 'Big Pineapple'. Why? Because that term, when spelled phonetically is 'da boluo', which sounds a lot like the name you and I know it by.



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1 Adjustable headband

Flexible and adjustable with memory scale to ensure each head shape is suited to the best possible fit

2 Piano style finish

Piano style polished finish has been applied to make the headphones durable and to ensure the brilliant color never fades

3 Adaptive ear muff

Bi-directional adaptive ear muffs enhance low frequency audio performance to make long term wear of the product comfortable

4 Plug-in audio cable

Plug-in audio cable design, 24k gold plating, reliable connection and difficult to break down

5 Cotton protein material ear muffs

skin friendly protein material that is comfortable and breathable and won't irritate skin allergies through long term usage

6 Steel reinforcement

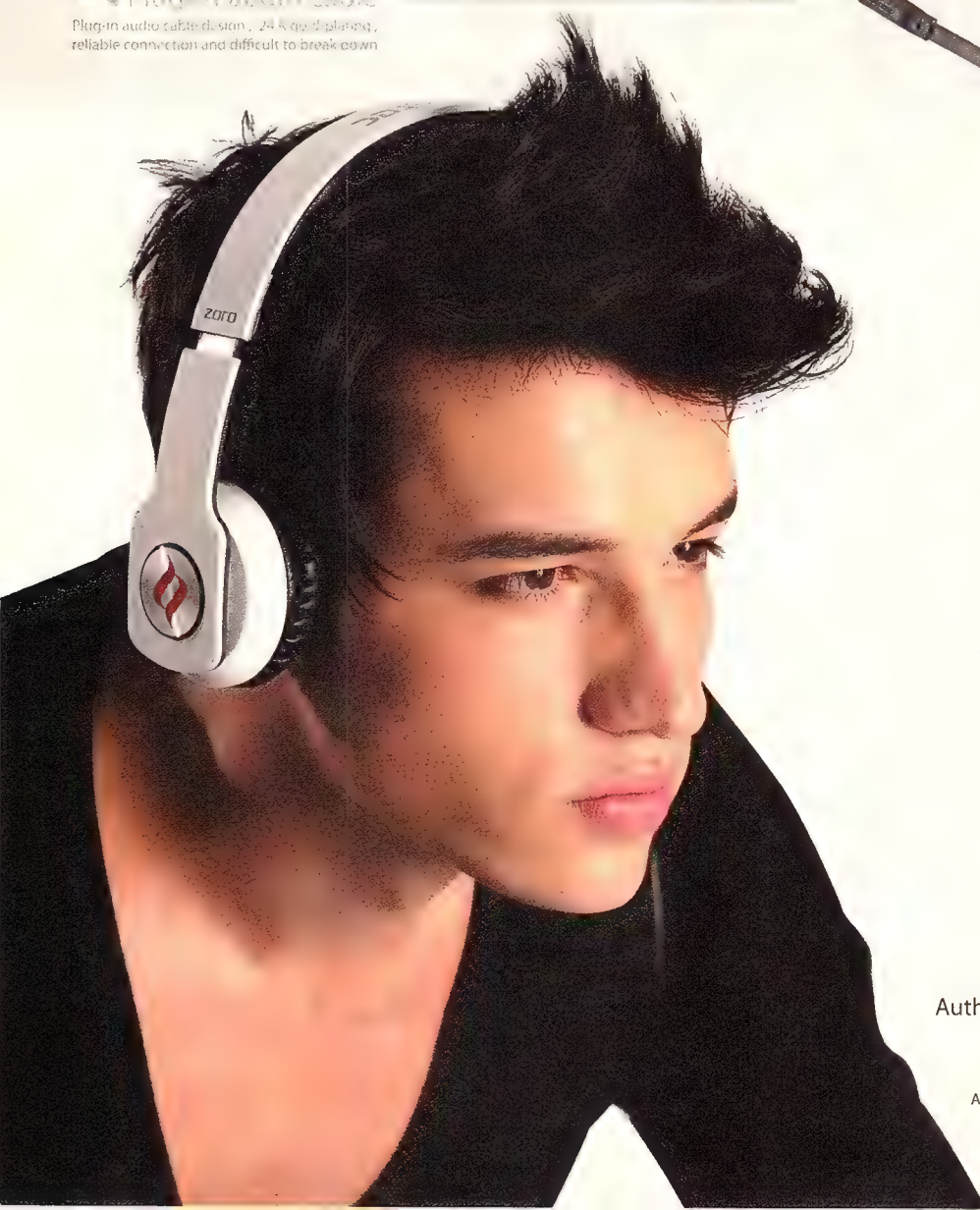
Delicate adjustable steel reinforcement to enhance the headphone longevity

7 Fold-up Design

Portable fold-up design, matched with a nano sized material storage bag allows it to be portable and conveniently stored

8 Unique flat cable

Unique flat cable design, high elastic TPE material ensures it won't wrinkle and knot



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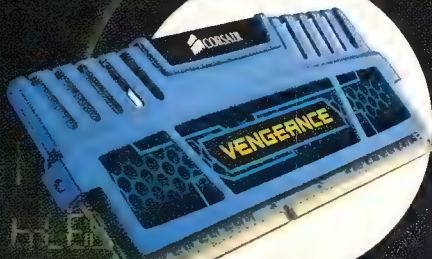
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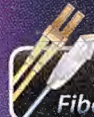
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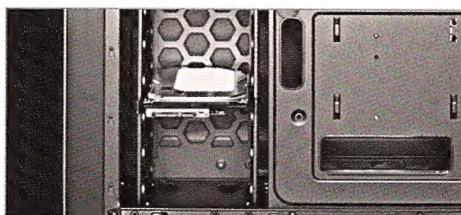
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